

ECOLOGY ACTION'S GARDEN COMPANION

GROW BIOINTENSIVE® News from Around the World

A bumblebee at VGFP tickles the pollen from flowering phacelia, a fantastic early-season pollinator plant!



image: victory gardens for peace

SUMMER 2021

IN THIS ISSUE:

THE JEAVONS CENTER REPORT • VGFP REPORT • GLOBAL GB PARTNER:
BIOINTENSIVE FOR RUSSIA • COMPARISON: STRAW VS LIVING MULCH
• BOOKLET 38: COMING IN JULY • WORD OF MOUTH: FARMING WITHOUT
PLASTICS • BOOK REVIEW: SEED LIBRARIES • WORLD OF HOPE: SWEET
POTATOES! • G-BLACK SEED-SAVING VIDEO • SOIL SCIENCE SPOTLIGHT:
N, P, S, AND SOIL MICROORGANISMS • ECOPOL: EL JAROCHO ARTICLE
• HTGMV IN ARABIC • STRAWBERRY HIBISCUS TEA
• EA EVENTS AND OPPORTUNITIES ... AND MORE!

The Jeavons Center Mini-Farm Report

By John Jeavons, Ecology Action Executive Director

*"It is such a blessing to be part of
such an elegant and friendly ecosystem!"
"You will either make things happen, watch things
happen, or wonder why things happen."*

– Sage Miller, TJC FTT, planting crops in May, 2021

As you can see from the quotes above, aptly named Farmer-Teacher Trainer Sage Miller continues to bring a joyful wisdom to his work at The Jeavons Center! And we are hungry for joy as 2021 continues to be an "interesting" year for Ecology Action (and the rest of the world), as we learn to cope with the ongoing challenges presented by COVID 19, and a continued water situation in a drought year. But as Sage says, being proactive in making things happen is preferable to watching or wondering why things happen, and so we take inspiration from the vital and resilient ecosystem we live in, and from the work of our global GROW BIO-INTENSIVE® family, to continue to grow as a source of GB information, education, technical support, and inspiration, to pursue our goal of facilitate people everywhere to catalyze pro-activity in growing their own soil, food, and thriving ecosystems.

While some of our planned projects are on hold as we wait for a rainier year, other projects are moving ahead. TJC current conditions and activities in 2021 include:

- **Continued soil improvement**, as can be determined by the lush growth of two varieties Cold Weather Fava Beans, even water holding capacity of the soil to a depth of 24 inches in many of the grow-beds, and the soil's relative friability. All this thanks to hard work and energetic application of the GROW BIO-INTENSIVE method by 2020 Fit Team.



- **Climate challenges:** Northern California is currently experiencing an historic spring drought and the rainfall level in Willits is at 20 inches. To put this in perspective, in our first year at TJC in 1972 we experienced 84 inches/7 feet of rain! A more normal level for this

time of year might be around 45 inches. The entire state is struggling with water shortages, and even with GB's water-saving ability, we may need water brought in as the season progresses to properly water the 17 GB annual beds planned as well as numerous perennial beds.

- **Workshops:** We hosted our Spring 3-Saturdays Zoom Workshop in March, with participants from across the US and beyond: three from Virginia, two each from Bermuda and Texas, and one each from Alabama, California, Connecticut, Idaho, and Illinois. Some participants in the southern U.S. are involved in key projects to help low-income families and children become more food-secure, and their example is heartwarming. All the participants provided progress and inspiration for all of us! We plan to hold our Fall 3-Saturdays Workshop online as well, on November 6, 13 and 20, 2021—if you would like to attend, you can register at: growbiointensive.org/workshop.html

- **Internships:** Ecology Action's second 8-Month Online Internship began in April with an even larger crop of global participants than last year: sixteen from Kenya, four from California, two from Spain, and one each from Canada, Chile, Guatemala, Hawaii, Honduras, Malawi, Mexico, New York, Nicaragua, Puerto Rico, and Sudan. Having such a wide range of participants from across the globe in one class is a wonderful experience, and provides unexpected benefits to us all. For example, one participant has already offered to collect data for bananas to be included in the Master Charts for the next edition of *How to Grow More Vegetables* (bananas are an important fast-growing tree crop that provides calories and biomass for farms and gardens the tropics). Ecology Action has been wanting exactly this type of information for a long time. Another participant will translate the *Farmers Mini-Handbook* into Japanese!

Depending on COVID regulations, VGFP may offer a few onsite 6-month internships for U.S. participants, but TJC will not host onsite interns in 2021 or 2022. Instead, with a goal of developing an increased number of Farm-Leaders and Trainers on all continents, we will continue to host about 30 participants each year in our popular 8-Month Online Internship. Interested? Apply at growbiointensive.org/Internship/8Month.html

- **Establishing an experimental 10-Bed Unit (10BU)** in our restrictive serpentine soil, potentially leading to the development of a complete one-person diet/soil-growing combination in as little as a 1,000 square-foot growing area. This work complements the ongoing 10BU research at our Victory Gardens for Peace site, as well as other locations globally. Even though

there will be fewer annual growing beds than the traditional 40-bed unit, the 10-bed unit that will evolve over time from this and other experiments will include our normal demonstration, education and research aspects to learn from. Crops planted by Sage Miller in this 10BU to date include 65-day maturing Potatoes, as well as Dahlias, Sunn Hemp, and Flax.

An important aspect of the 10-bed unit is the choice of not only the basic plants that will make up the diet, but of the specific varieties used, which can make a difference in how successful a diet design will be. For example, the 65-day maturing potatoes Sage is using in this garden yield the same as 95- and 120-day maturing ones, and so they produce more calories and nutrition in much less time—using less water and labor. This attention to detail is important in a world with a rapidly decreasing amount of farmable soil, as approximately 12% of the calories, 8 % of the protein, and 18% of the calcium eaten globally comes from potatoes grown on 2.4% of the cropland. Some varieties of dahlias, the national flower of Mexico, have the unusual potential of being an all-around “60:30:10” crop, as they can produce a significant amount of biomass in their stems, edible calories in their tubers, and income from their beautiful flowers. Flax-seed is good for eating and provides a good source of vegan omega-3 fatty acids. It also provides fiber from which twine can be made—and some varieties are good for producing fine linen!

• **Legume interplanting experiments** continue to focus on growing crops and soil fertility in the smallest area at the same time, through well-chosen crop pairings.

Soil programs with involvement of EA headquarters at The Jeavons Center:

• **Sponsoring the GROW BIOINTENSIVE® Soil Test Analysis and Amendment Recommendation (STAAR) Training Program** with EA Soil Fertility Advisor John Beeby as master teacher. I have great hope for the STAAR program, which focuses on educating GB farmers and farmer-leaders to understand and use soil test analysis and scientific soil amendment recommendation standards to build lasting and sustainable soil fertility now and into the future, and believe it will help to reverse the rapid depletion of the world’s farming soils.

The first year of the STAAR program has been funded, and its 14 participants began the four-year program on March 28, 2021. Everyone is excited about the classes they are taking. Participants include several people in Latin America, Kumiko Tsutsui in Guatemala, Agustín

Medina in Aguascalientes, Mexico, and Suzana Hernandez in Chile; plus Simon Nayaga in Kenya, Guillermo Rodriguez Barrio in Spain, and Shyam Payakurel in Nepal, Matt Drewno in Mendocino, CA, and James Christie-Fougere in British Columbia, Canada.

As a part of this program, by the end of 2022, John Beeby hopes to release a companion booklet to *Test Your Soil with Plants*, which may provide an easy guide for farmers everywhere to perform a complete soil test utilizing just three plant crops and a pH strip.

• Another program, **Soil Test Research Stations (STRS)** is being implemented at 10 different sites around the world with different soils and ecosystems. The goal at these sites is to use local food crops to grow one person’s complete annual calories and plus compost materials needed for the growing sustainable soil fertility, including sufficient carbon and nitrogen. A newly formed soil group that includes John Beeby, Agustín Medina, Steve Moore and Matt Drewno is working together to determine how to make these soil test research stations most effective.

International programs with involvement of EA headquarters at The Jeavons Center:

• Our Latin America and European partner, **ECO-POL-El Mesquite**, led by Juan Manuel Martínez with Agustín Medina and Marisol Tenorio, is developing a new website to expand its teaching of CULTIVE BIOINTENSIVAMENTE^{MR}. It is estimated that ECO-POL has directly and indirectly trained about 350,000 new farmers a year for a total of ~3.7 million people provided with access to GB education during the past 11 years.

• Our Kenyan partner **G-BLACK**, led by husband and wife Co-Directors Samuel Nderitu and Peris Wanjiru, are working to establish satellite training stations in the 47 Kenyan provinces. As of April 2021, they have established 39 of these stations, and hope to make GB available to everyone in Kenya by 2030.

Now more than ever, it is vital for everyone to know how to grow food and soil, sustainably.

As you read this issue, you will see the how Biointensive projects are growing around the world, helping to heal the Earth and its people, right where they are. We love our Global GROW BIOINTENSIVE Family and are proud of the work we and our partners do. We look forward to growing strong with you through 2021 and beyond!! ●



Victory Gardens for Peace Mini-Farm Report

By Matt Drewno, VGFP Mini-Farm Manager

“When I go into the garden with a spade and dig a bed I feel such an exhilaration and health that I discover that I have been defrauding myself all this time in letting others do for me what I should have done with my own hands.” – Ralph Waldo Emerson

Each day in the garden is an opportunity to grow. And what a gift it is! Here at Victory Gardens for Peace we approach each day with gratitude for the lessons learned, and those which constantly reveal themselves in the garden. What a blessing to be able to work with the Earth and to be worked by the Earth: to nurture that which nurtures you! Our 220-bed research, education and demonstration mini-farm is located on the Mendocino Coast in Northern California. We are transitioning our overwintering legume cover crops into main season grains, pulses, vegetables, flowers and seed crops. It's an exciting time of year as increasing day-length awakens the pollinators to meet the profuse blooms of wildflowers and overwintering seed crops. The vital force of spring lifts us and carries us, and as we cultivate the soil from winter's rest we, too are invigorated by nature's verdant and prolific vitality. Springtime is a celebration, a resurrection, and a perennial joy. I hope that over the past year you have found the inspiration to grow more soil, food and seed than ever before, and that that inspiration carries you forward with joy into the garden.

By the time you are reading this, our summer internship and course will have begun. Each year we bring folks from different parts of the world and our community to share experience and learn together about the GROW BIOINTENSIVE® Method (GB). While COVID has hindered our ability to accept international students, we have adapted to integrate our curriculum and local outreach into an exciting new program we are calling GardenCorps which we are offering to domestic students. More on GardenCorps later, but I would like to say how impressed I have been with the quality of the 8-month Online Internship program which has enabled Ecology Action to continue our international outreach and education despite the challenges posed by the COVID crisis. Each week dozens of interns gather online to enhance their understanding of the important solution of the GB Method – a real world example of technology promoting sustainable progress!

Our Victory Gardens for Peace Seed Bank continues to grow, and we have developed a new online platform that allows us to take online orders and ship them to our community. This has enabled us to continue to distribute seed during the pandemic, and also helps us better track what seeds are popular so we can continue to grow out priority seeds for the North Coast of California. You can learn more about this important project at victorygardensforpeace.com. We will be publishing a booklet by the end of 2022 on how to start a community seed bank and reintegrate seed saving into your community, so everyone can access local, healthy seed.

This year we will be focusing much of our growing area into replenishing seed stocks after last year's big rush on our seedbank. Seed saving is a wonderful part of the GB Method, which not only saves money, but also helps adapt local varieties and increases food security. And that's not all! The flowers of seed-producing plants provide food and habitat for pollinators and beneficial insects. In addition, as plants mature, their carbon structures change and their biomass increases to support their blooms and seeds. This biomass provides wonderful materials for the compost pile, which farms more carbon from the atmosphere and helps us increase the organic matter of our soils for increased fertility and sustainability.

As I write, we are transplanting our grains and summer crops after a dry winter and entering what appears to be a rather severe drought-year. That makes it even more important to note that GB uses only a third of the water that conventional agriculture requires to grow food. GB incorporates carbon-rich crops and composting, which increases soil organic matter levels, which further-enhances the soil's water-holding capacity. And with a good diet design, such as the 10-Bed Unit complete Diet Design we are experimenting with in VGFP's coastal climate, as little as 2-10% of the water is required to grow a complete diet and sustainable soil fertility, on less than 2% of the land, as compared to a conventionally grown American diet.

When you understand what is possible with GB, you discover a world full of hope and possibility. I call this inspiration “discovering the endless well.” Our gardens are a way forward, a whole-systems solution, which helps us reduce energy and resource consumption, decrease our land-area requirements for food production, and enables us to put more of our precious biosphere into full-functioning, restored

ecosystems to be preserved for the health and integrity of the plant. We don't have to carry the weight of the world's challenges, we just need to start doing what makes sense, and the solution is so beautiful and delicious! Grow a sustainable vegetable garden with the GB Method! Ecology Action is publishing my work in Booklet 38, *A Path to Peace and Sustainability: Growing Soil, Food and Seed in as Little as 1,000 Sq. Ft.* which everyone can use to begin designing and growing their own 10 Bed Unit. It should be available for purchase at growbiointensive.org/publications_main.html in mid-July.

One of the greatest joys of this work is sharing it, and seeing others grow. Our work in the nearby city of Fort Bragg, CA to pass the Garden Friendly Community Resolution (victorygardensforpeace.com/resolution) has blossomed into a movement to establish community gardens across the city. We are currently volunteering to help create two gardens which should be complete by the end of the year, helping others experience the joy of helping themselves through growing a garden. We will be supporting this work with free GB resources, seeds from our seed bank, and establishing community networks to help strengthen a movement towards sustainable food localization.

In 2019, we determined that with 5-10 years of experience and soil buildup, that it would be possible that all the calories needed to feed Fort Bragg's 7000+ residents could be grown in open land within the city limit. This year we are starting our pilot GardenCorps Program which will combine our knowledge of the GB Method with our community organizing experience in Fort Bragg. In addition to training in the GB Method and sustainable diet design, this program includes classes in agricultural leadership, community organizing, and project development. We have fund-raised four full scholarships from the community itself, with the agreement from students that they commit to 50 hours of community service in establishing community gardens in Fort Bragg, CA. We are so proud of this work and the participants in the program!

The United Nations predicts that we have around 55 years of soil remaining. At Ecology Action, we believe that this number is more likely to be much less: as little as half of this amount. The need for replenishing soils, while also increasing yields sustainably is more important than ever. This year we are excited to have been chosen as one of 13 GB training sites worldwide to participate in the Soil Testing

Analysis, Amendments Recommendation Training (STAAR) Program. This program trains individuals to establish 10-bed-unit soil-test stations, to be able to act as hubs in the community to help farmers and gardeners improve their soils with the low-input GB Method. This training is run by John Beeby of Grow Your Soil (growyoursoil.org) who has for the last 20 years been creating and monitoring organic fertilizer recommendations for GB farms around the world. John, Steve Moore, Laura Taylor, and Samuel Nderitu published *Effects of a One-Time Organic Fertilizer Application on Long-Term Crop and Residue Yields, and Soil Quality Measurements Using Biointensive Agriculture* in the journal *Frontiers of Sustainable Agriculture* last year. This work helped inspire the STAAR program with the powerful and scientifically documented low-input studies on several GB farms across Kenya. Congratulations John, Steve, Laura and Samuel on such important work!

As we continue to develop Ecology Action's Victory Gardens for Peace Sustainability Hub we strengthen our foundation and our ability to serve our community and the greater GB movement. What we learn, we share, and are constantly inspired by the wonderful work of GB farmers and projects around the world. We are a family, brought together for the love of the work and the hope that it brings. We invite you to connect with us—if you would like more information visit www.victorygardensforpeace.com or email Info@victorygardensforpeace.com. Thank you to our donors and all those who contribute to keeping Ecology Action strong and serving. We wish you all wonderful, abundant and beautiful garden year! ●



Victory Gardens for Peace Mini-Farm awakening after winter rest

Global GB Partner: Biointensive for Russia

By Carol Vesecky, Director, BfR

Как выращивать больше овощей*

(а также, фруктов, орехов, ягод, зерновых и других культур)



HTGMV in Russian is available at growbiointensive.org/HTGMVRussian

The following is an excerpt of a longer article, which we are unable to print due to space considerations. Read the full article at growbiointensive.org/Enewsletter.

As I remember, my professor dad grew most of the tomatoes, green beans, sweet corn, and peas we ate during the summers in my early childhood in Wisconsin in the 1950s. My mother froze and canned the produce, often with my three siblings' and my aid, for example shucking peas on our screened porch, or slicing the corn kernels off the cob in the kitchen. For at least two summers I worked regularly with Dad in his garden plot, under his tutelage growing corn and beans in my own rows. I sold them to the neighbors one year, earning five dollars, which at age eight seemed a princely sum! We also picked apples from our three trees—Duchess, Jonathon, and Wealthy—for Mother to bake into pies or for us to smash into applesauce.

During my school, college, and young married years for the next 20 years or so, my vegetable gardening lay dormant. But as a gesture to hippie culture, my husband John Vesecky put in a garden at our rented home in Menlo Park CA in 1970. Then in 1974, he set some cherry tomato plants out in the greenhouse in back of our “semi-detached house with a bi’ o’ garden” in Leicester, England, where he taught at the local university for several years. That winter, at his request I dutifully kept his plants watered while he

was back in the US for a conference. It then occurred to me that, just perhaps, I myself could sow some seeds and water them, and they might even sprout! I did so and soon, fascinated, I was watching pea tendrils miraculously growing and eventually producing flowers, pods, and ... lo and behold, peas!!!

I was expecting my second child, so watching new life naturally resonated inside me. Born in late spring, baby Holly turned out to be colicky, so to calm her when she woke me around dawn, I would put her in the corduroy-and-flannel carrier on my back and go out to the greenhouse to tend the veggies as the sun rose. During Holly's and her brother Stephen's quiet times, I worked on scientific and technical translations, making use of the Russian and French languages I had studied at Stanford. But, when not translating, I would often be out planting lettuce and carrots, and tending the tiny veggie garden along with all the rose bushes we had inherited from the former owner. I remember making the lettuce into soup, there being far too much of it!!

We moved back to Palo Alto, California in 1977 when the children were still little and settled into a house within walking distance of St. Mark's Episcopal Church, where my family and I attended the folk eucharist service with John Jeavons and his family. While cooking for a UNICEF benefit dinner I had organized, I got better acquainted with co-volunteers Betsy Jeavons and Robin Leler, who ran Ecology Action's Common Ground Garden Supply and Education Center together. Common Ground was within easy biking distance of my home, so I started taking the Saturday morning classes offered there on all aspects of Biointensive and organic gardening by John Jeavons, Louisa Lenz, John Beeby, Carol Cox, and many other adepts.

Betsy and Robin told me about John's work in Ecology Action's large research garden in the Stanford Industrial Park, practicing the Biodynamic/French Intensive mini-farming practices he had learned from Alan Chadwick and his apprentices at UC Santa Cruz. Then, after hearing about my educational background in languages, they invited me to visit their home and garden and meet John, who then recruited me to co-edit the French translation of the booklet “*Biointensive Mini-Farming: A Rational Use of Natural Resources.*” That led to my typesetting the French translation of *How to Grow More Vegetables* on Jean-Marie de la Beaujardière's pre-Macintosh computer at the Xerox Palo Alto Research Center on Saturday mornings from 1980-1982. Then came the

ECOLOGY ACTION'S GARDEN COMPANION



Dr. Ludmila Zhirina, Director of Russian NGO VIOLA, in a GB garden with Russian HTGMV and a radiation dosimeter in the Ukraine, near Chernobyl

German translation, on my first home (CP/M, pre-IBM PC and Windows) computer, in 1983.

The Cold War was at its height then, but that had begun to change in November 1986, when a historic youth exchange organized by the Earthstewards in Washington state took place and I helped host 21 teenagers from Siberia during their visit to the Bay Area. One of the chaperons was Viktor Yukechev, Novosti Press Agency bureau chief for Novosibirsk. An avid gardener, he gratefully accepted my parting gift of *How to Grow* in English. Viktor and I then nurtured the dream together, via post, fax, and phone, of publishing a Russian translation.

The following year, I traveled to the USSR on my first citizen diplomacy tour with the Earthstewards, and shared copies of the book in English and French with Russians I met, who assured me that it would be very popular there. Hence, in Moscow with the National Council of Churches group in 1988, Viktor having sent me his phone number, I visited the chief editor of the practical books-oriented Mir Publishing House. Sure enough, the Mir editor expressed interest in publishing the book! But by the time of my third citizen diplomacy tour in 1989 (led by me), I learned that alas, competition for paper and printing resources was too great. In the following years, more publishing efforts were made, but foiled each time.

Our first Ecology Action workshop with Russian participants resulted from the visit of Muscovite Vladimir Novosyolov to Willits, CA during one of the Center for Citizen Initiatives (CCI) exchanges in

SUMMER 2021

1989. Nine Muscovites hoping to acquire home and garden plots in the country, leading to vast quality-of-life improvements over their communal apartments, visited the Bay Area in 1990, and John Jeavons taught a 5-day workshop for them at Stanford University. We provided home stays in Palo Alto and environs, and they visited Willits for a day tour of the early Jeavons Center garden. Most were journalists, so Biointensive got media attention in the USSR that year.

A few weeks later, Moscow agronomist Tatyana Ivanova participated in a 5-week workshop along with Kevin Ashley, who spent the summer in Moscow and double-dug gardens in two locations with CCI partner Natalya Skribunova and her friends. Kevin wrote wonderfully informative, detailed letters during his stay, scans of which are available for those who request them from me at <cbvesecky@gmail.com>.

Back to *How to Grow*: years later in 1992, Viktor Yukechev sent us the translation he had commissioned in Novosibirsk/Akademgorodok, and we were able to obtain US Peace Corps funding for its editing, typesetting (on borrowed Macintosh computers in Palo Alto and at Stanford), and proofreading. We were not yet using email by then, and there were only 14 phone lines into the USSR. So, due to the greater ease of phone and fax communication with Moscow, publication finally was accomplished there with the aid of Boris Khersonski, who was putting out books on business topics in Russian at the time with Sharon Tennison's CCI.

The Peace Corps contributed to the effort by pre-paying \$10,000 for 400 copies of the book for their volunteers in Russia, to share in the communities where they taught English and business methods for the eleven years ending in 2003. Thus, I was able to pay my excellent team for editing and proofreading, and myself for preparing the camera-ready copy with an early Apple layout program and physical paste-ups of the illustrations.

Next, Liza Loop, another citizen diplomat and Earthsteward, and I created Biointensive for Russia (BfR) as a nonprofit project fiscally supported by LO*OP Center, the 501(c)3 organization she directed. The Moscow publisher's marketing effort seemed weak, so our initial effort was to give Americans the chance to present a copy to Russians they had befriended during the era of citizen diplomacy exchanges. We mailed out a brochure requesting \$10 and a Russian name and address, then faxed the names we received

{...continued at growbiointensive.org/Enewsletter}

Comparison: Importing Straw Mulch vs. Creating a Living Mulch with Close Plant Spacing

By Matt Drewno Mini-Farm Manager

A Whole-Systems Comparison of Importing Dead Mulch to Living Mulch Created Through Close-Plant Spacing Mulch is often used to conserve water and protect the soil. Is this the best use of these materials								
Method	Description	Water Use			Input		Pros	Cons
		Direct Conservation	Indirect Resource	Financial Cost	Resource Import			
Dead Mulch	2 bales of straw (hay may contain weed seeds!) will cover 100 sq. ft. to a depth of 3 inches.	Can reduce evaporation by up to 80%.	1 Bale of straw requires 8,690 gallons of water to grow. Each bed requires 17,380 gallons of water to grow 3" of straw mulch. A 40-bed complete diet design with 3 crops per bed each year would require 2,085,600 gallons of water for 240 bales.	\$10-\$15 per bale. 40 beds mulched 3x each bed per year would cost \$1,200-\$1,500 dollars/year	1 acre produces 50 bales of straw. Importing straw means importing the soil nutrients from the acre it was grown. Those bales are better composted on-site and not exported.	Conserves water and soil structure.	Habitat for slugs and some disease organisms- light surface airflow can be beneficial to your plants. If the straw contains herbicide or pesticide residues these can enter your garden soil. Over a gardener's lifetime, with a 40-bed design and importing mulch for each crop, over 165,000,000 extra gallons of water would be required at a cost of \$96,000-\$120,000 dollars.	
Living mulch	With deep soil preparation you can place plants hexagonally, closer together so that as they mature the leaves touch and create a shady microclimate in the bed. This conserves water and increases soil health.	Can reduce evaporation by 63%. If yields can be achieved 2-6x conventional, water use per lb of food produced is significantly higher with close plant spacing and GB techniques.	None. With the water saved each year (2,085,600 gallons) and with the 10-bed diet design in the appendix of this guide, complete diets for 60 people could be grown biointensively without importing mulch.	None. By using close plant spacing instead of mulch you save \$96,000-\$120,000 over a human lifetime.	None. On the 4.8 acres it took to grow the straw for mulch, an ecosystem could be restored or the farmer's fertility better managed.	Conserves water and soil structure without costly inputs financially or environmentally. The living mulch materials grown from close plant spacing are then composted on site and turned into soil humus to further increase water conservation and moisture holding capacity of the soil.	For the first 3-4 weeks before the microclimate fills in, up to double the water might be necessary to maintain optimal soil moisture. Once the microclimate is established, significant water efficiencies are achieved.	

The *Living Mulch Effect* created by close plant spacing creates a microclimate conserving soil moisture, soil structure and trapping carbon dioxide respired from the soil microbes utilizing it for plant growth through photosynthesis. This living mulch can reduce evaporation by up to 63% in the growing bed, fixes carbon and is later composted on - site to regenerate soils and further increase water holding capacity. *Dead Mulch* is imported from off - site and robs another's soil to feed your own.

EA Booklet 38: Coming in July!

By Matt Drewno Mini-Farm Manager



VGFP's Mini-Farm Manager Matt Drewno has finished Booklet 38: A Path to Peace and Sustainability: Growing Soil, Food and Seed in As Little As 1,000 Sq. Ft. and it will be available for purchase as soon as we get it back from the printer on July 15. The printing of this important publication is made possible in honor of Paul Hwoschinsky, who three decades ago helped catalyze the GB Africa Program. Paul said "The most important thing about GB is that it creates Community!" Five years in development, this 76-page booklet with many full-color photos is a beautiful and thoughtful work, and Matt's writing style makes it a pleasure to read. To give you a taste of what's to come, we wanted to share this excerpt with you. Enjoy!

Author's Note

It has been a journey to create this booklet. The journey began with a love for plants, soil and Nature and has evolved into a search for a sustainable way forward for humanity which embodies a whole-system approach to meet a multitude of challenges at once. The destination is still down the road, but we know where we are going and how we can get there.

I am excited to share this solution with you because not only is it an effective way to solve many problems at once, it is beautiful and fun and draws the individual closer to a living universe that we have isolated ourselves from. It is almost as if humanity has gone through adolescence and individuation from our Mother Earth. In the growing pains of our existence, we have caused great suffering and destruction on the planet. And as we mature, we look back at our-

selves, our relationships, the paths we have chosen and in this opportunity, we must consider our next step:

Do we continue on as we have, and risk losing everything on this beautiful planet?

...Or, do we navigate these challenging waters with grace, integrity and sensitivity to once again discover the inseparable wholeness that is Nature, that is us?

This is about a journey of the self as much as it is about a solution to the global agricultural crisis. It is about empowering oneself to live in a way that contributes to the world, that brings creativity and harmony into a world teetering on disaster. As you will see, it can be a panacea. It can bring hope. It is more than a metaphorical journey back to the garden. It carries with it the living experience of Nature. And in nurturing that which nurtures us, and striving to give back more than we take and leave the world in a better place, we awaken to a purpose and strength beyond imagination.

I am so glad that you have this in your hands, because I have experienced some of the gifts along the way and I know that there is so much potential in putting our hands back in the soil. Why else do we have these arms and legs? Our destiny is a return to the Earth, a realization of our place, and an activation of the human spirit to save our future. In the garden, we honor the past by carrying forward the traditions of cultivation, we acknowledge the present by being present and we honor the future by sowing the seeds of peace and abundance.

This work is timeless and carries on forever. It is inspiring and delicious. May we grow together, forever!

"It is not the gardener that makes the garden. It is the garden that makes the gardener."

—Alan Chadwick ●

HELP WANTED
ECOLOGY ACTION NEEDS A FULL-TIME BIOINTENSIVE FARMER!
Enjoy a sustainable lifestyle working at one of our two Biointensive Research and Demonstration Mini-Farms in Mendocino County, CA.
\$15/hour plus benefits.
Full details at growbiointensive.org/Opportunities.html

Farming without Plastics

By Michael Foley, Green Uprising Farm
From Word of Mouth Magazine (wordofmouthmendo.com)

The following is an excerpt of an article on an important topic, published in Word of Mouth Magazine in 2020, at bit.ly/WordofMouthFarmingWithoutPlastic

When I started farming back in Maryland, I based a lot of my organic farming methods on Eliot Coleman's *The New Organic Grower*. Somewhere in that book, he presented a back-of-the-envelope calculation comparing the carbon footprint of a head of lettuce grown in California and shipped to the East Coast versus a head of lettuce grown under plastic in his Maine hoop house. His head of lettuce won hands down.

Coleman convinced me that year-round farming was the way to go. I put up my first hoop house in 2005 and haven't looked back. But when we moved to Willits in 2007, it was already clear that Coleman's calculation couldn't apply. A Salinas Valley head of lettuce had a lot less miles on it traveling to Willits than those shipping to eastern markets. Still, I built hoop houses and encouraged others to do so. I bought row covers to protect outdoor plants through fall, winter, and spring. I bought shade cloth to protect tender lettuces from the bright California sun. And a couple of years ago, we started buying ground cloth to kill off weeds and prepare the soil for planting.

I already knew plastic was bad for the environment, but I consoled myself that the most common plastics in our farming practice were the least bad: black plastic polyethylene mostly, and polypropylene for the greenhouse plastic and row covers. But plastic turns out to be much worse than I imagined. It is not just another fossil fuel product. It's a product that pollutes all by itself as it off-gases additives and degrades into tinier and tinier pieces. The scourge of micro-plastics (plastic fragments less than 5mm in length) is becoming clearer, as they turn up in the intestines of fish and wildlife, in our drinking water, and in our own guts. We know that the bigger pieces kill plankton and other small forms of aquatic life, and many of them carry toxic chemicals, from BPA to phthalates, both responsible for a lot of reproductive harm in mammals, including humans.

Bioplastics aren't necessarily better. Some of them biodegrade, but only under special circumstances—not in your compost heap, garden soil, or the ocean. Some of them don't. Recycling, in the meantime, is in something of a crisis. From an environmental perspective, we have

to get plastics out of farming. But can we? On the one hand, the answer is, "Of course!" Humans farmed for 10,000 years before the advent of plastic just a few decades ago. We can do so again. On the other hand, this farmer—and I'm sure many others—is finding it hard to break the addiction.

Winter farming without that plastic hoop house? The French market gardeners of the 18th and 19th century did it, with glass topped cold frames and "hot beds" warmed by composting manure, but it took a lot of labor, glass, and manure. Then there are the "fruit walls," south-facing walls of cob or brick that absorb the sun's heat during the day and stave off the cold during the night. Put a glass window in front of the wall and you have the beginnings of a greenhouse.

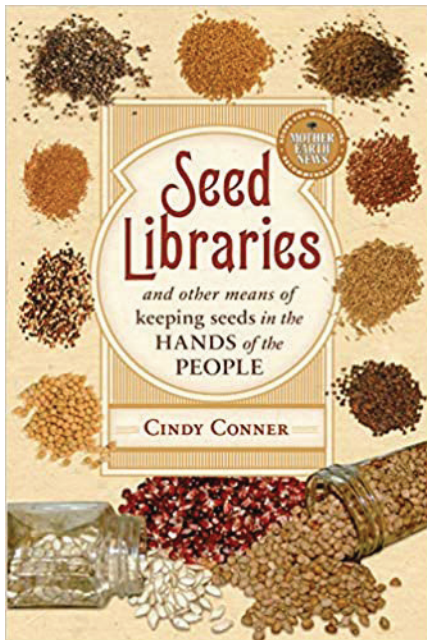
So there are tools out there that we might adopt and adapt as we try to find our way past the Age of Plastics. The glass greenhouse will be very expensive but last a long time. Other alternatives vary a lot in durability and cost. One of our mainstays at Green Uprising Farm in cooler months is row covers, sheets of spun polypropylene draped over low hoops down each row. Plants get protection from wind and chill, and the ground stays a couple degrees warmer. We've experimented using large pieces of cheesecloth and have found that they're better than plastic. They stay up in the rain and snow, and they seem to last longer than the plastic version. They are also twice the cost.

In hot weather, we depend upon shade cloth. It covers much of our salad garden and our propagation house. This summer I tried the old alternative, used for centuries in farming cultures around the world—reed mats, sold as "reed fencing" here. It only took a few to cover the propagation structure. They're much cheaper than shade cloth and much more attractive, and they give very effective shade for tender starts and microgreens.

Before market gardeners adopted plastic landscape cloth to kill weeds and prepare soil for working, organic gardeners and permaculturists advocated plain old cardboard. It works, and big pieces can be obtained from your friendly local furniture store. It can be cumbersome and ugly too, and we still have all that landscape cloth, but we're using both now. Bigger farmers depend upon sheet plastic mulches to suppress weeds, especially around delicate strawberry plants. But I met one farmer in Monterey County's strawberry belt who was experimenting with burlap. We're now trying out burlap to preserve the moisture around slow-germinating carrots, following the advice of Paul and Elizabeth Kaiser at Singing Frogs Farm... {continued at bit.ly/WordofMouthFarmingWithoutPlastic}

Book Review: Seed Libraries and other means of keeping seeds in the hands of the people

By Cindy Connor, Review by Matt Drewno



Seed saving is a critical component of our local food system, but how many communities can say they supply even a small amount of the seed that becomes the food on their tables? Not long ago, the food we ate came from the seeds we grew, and saved. In today's world of consumerism and local foodies, most of the food varieties we eat are now hybrids—

seeds which are produced and sold by companies with profit in mind, and not always considerate of nutrition and the health of our soil or communities.

For some, seed saving is a revolutionary act. For others, its just fun and exciting. The majority of the variety that we have remaining (we have lost over 90% of our food varieties in the last 150 years) we owe to the small grower and backyard gardener. It's the small grower and backyard gardener who have placed quality over everything else, and had the skill and love to work with these plants to bring about new varieties in the endless cooperative and nurturing relationship we find in the garden.

Cindy Conner's book *Seed Libraries and Other Means of Keeping Seeds in the Hands of the People* (New Society Publishers, 2014) is a marvelous accounting of the blossoming movement of seed savers growing around the country. Today, in libraries and gardens across the US and in other countries, people are sharing seeds, information, and the love of gardening. And its free! Many of our libraries now have seeds which you can check out like books, in the hope that you also return some of the seed you save to keep the abundance flowing. This book is an inspiring and detailed account of the seed library movement. It provides tips for saving your own seed and resources to help connect you to the seed saving

movement. It is also a guide for those who wish to start a seed bank or seed library of their own.

The information in this book is well organized, well presented and inspiring. Cindy comes at the topic from her own personal experience in a way that is very relevant to seed-saving as a part of GB (she has been certified as a GROW BIOINTENSIVE teacher and is an experienced seed saver in her own right). I found this passage in her book to sum up her optimism:

"Some people think that the systems in our society are breaking down. I guess that's one way to look at it. In reality, systems need to change to stay relevant to the conditions at hand. It takes a special person to venture out of the norm and be the catalyst of a change that needs to happen. Thank you to all the pioneering souls who have already ventured into the realm of putting seeds back in the hands of the people. Also, thank you to those just beginning the adventure—the readers of this book—together we will make a difference."

A word of caution: having enjoyed the company of many engaged in this wonderful movement, I have to warn you, the seed librarians around the country are a warm and welcoming bunch. But I believe they are up to something... something big. Not only do they make good friends, but they are always plotting their next seed swap. And if you get invited to one of their potlucks, be ready: not only are they brilliant gardeners, community organizers, and seed savers, they are wonderful cooks too! ●

Ecology Action and John Jeavons Present: A "Three Saturdays" Zoom Workshop On Backyard Biointensive Gardening



Nov. 6, 13 and 20, 2021

***Learn to grow healthy food and fertile soil from
the author of "How to Grow More Vegetables"***

growbiointensive.org/workshop.html

Sweet Potatoes!

From GROW THE EARTH (johnjeavons.org)

Sweet Potatoes (*Ipomoea batatas*) are starchy root vegetables originating from Central or South America.

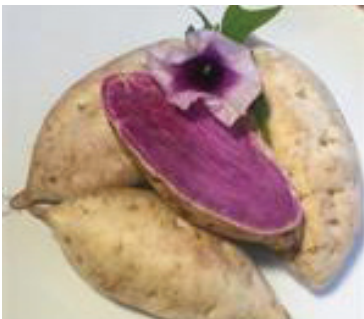
Not to be confused with starchier and drier yams (*Dioscorea*) from Africa and Asia, sweet potatoes have a long shelf life and are usually sweeter and moister than regular white potatoes (*Solanum tuberosum*). In addition to being delicious, they are a very important crop in diet planning, because of the number of calories they contain per pound, and for overall sustainable gardening and farming!

Globally, people get many calories through growing and eating both “Irish” potatoes and sweet potatoes as staple crops. Sweet potatoes are the most practical calorie producing root crop by weight (see HTGMV 9th ed., p. 40 for more details). Garlic is more weight-efficient, but one can generally eat only 2 to 3 cloves daily, while 5 pounds of sweet potatoes—an amount that can reasonably be consumed by an adult human—can provide all the required calories to sustain a person for a day. Of course, you will need to eat other crops to get the essential amino acids, vitamins and minerals you need, but if you start with sweet potatoes as the base of your food pyramid, you’ll be on solid ground. (Also, using other crops for the missing nutrients noted above will allow you to reduce the weight of sweet potatoes you need to eat. This is because those other crops also contain calories.)

Sweet potatoes come in many colors—white, yellow, red and even purple. Purple ones are an ancient superfood and turn a beautiful bright violet color when cooked! They are high in anthocyanins, the antioxidant compounds that have been linked with a reduced cancer risk. The Stokes Purple variety is available from friedas.com/stokes-purple-sweet-potato, and the Hawaiian Purple variety is available at hawaiiveggiefarm.com.

Check out this Pinterest board on purple sweet potatoes! bit.ly/2IWC440

Most sweet potato varieties take 6-8 months to mature. This makes it difficult to grow in many temperate climates, unless you do it under a double-walled miniature greenhouse (see HTGMV 9th ed., pp. 205-



212, and our FAQ on the topic at growbiointensive.org/FAQ/FAQ_Mini-Greenhouses.html) A plus for 6- to 8-month maturing varieties is the fact that you can harvest up to 20% of the nutrient-rich leaves (known as *talbos ng camote* or kamote tops in Spanish-speaking countries) for eating in the second month without lessening the ultimate yield. Excitingly, Sand Hill Preservation Center (sandhillpreservation.com/sweet-potato) in Iowa, carries 225 sweet potato varieties, (including Korean Purple), including eight certified organic sweet potato varieties that mature in only three months—and they come in many colors! Another supplier of OG sweet potato slips: southernexposure.com/categories/sweet-potatoes

A good article on the purple sweet potato can be found in the spring 2018 issue of *Heirloom Gardener* magazine. Another key resource for short growing season growing is *Sweet Potatoes for the Home Garden—with Special Techniques for Northern Growers*, by Ken Allan (available only from maplefarm.com).

Humans aren’t the only ones who love these delicious tubers: amazingly, gophers know three days before the optimal harvesting point that it is time to eat! To eliminate or minimize this challenge, you can build underground protection with a gopher cage (see “New Gopher Cage” article and illustrative photos on pp. 2-3 in the May, 2007 Ecology Action Newsletter growbiointensive.org/PDF/Mayo7EANL_GopherCages.pdf).

For a Biointensive garden, sweet potato starts and slips should be planted on 9-inch offset centers, 6 inches deep. For full sweet potato planning information see the Master Charts in HTGMV 9th ed., pp. 150-151. Hungry? Get planting! Bon Appétit! ●



Seed Saving | How To Save Your Seeds | Samuel Nderitu

Samuel Nderitu, Co-Director of our African partner G-BLACK presents an excellent informational and how-to video about saving the “lost seeds of Africa” at youtube.com/watch?v=wSu-BDYoh5A

Soil Science Spotlight: N, P, S, and Soil Microorganisms

By John Beeby (growyoursoil.org)
Ecology Action Soil Fertility Advisor

Understanding soil testing and the correct use of organic soil amendments is an important part of GB. John Beeby and Ecology Action created the “Soil Science Spotlight” to introduce the topic to the GB community. This is an excerpt of fourth post in that series. Read the full article (and the full series online at growbiointensive.org/SoilScienceSpotlight).

Mobilization: You test your soil to make sure that it has enough nutrients available to your plants for them to thrive. The lab provides you test results and may even include recommendations for adding nutrients to your soil. You make all the calculations needed to follow the recommendation only to find that your corn leaves are purple, indicating a lack of phosphorus. Why?

The simple answer is: recommendations provided directly from soil testing laboratories tend to lack depth. Determining whether your soil can provide sufficient available nutrients to your crop requires soil testing, but also requires additional in-depth analysis. Nutrient availability cannot be gauged with 100% accuracy by a soil test taken at one moment in time. For nutrients to be available to your crops, they need to be in the form of a positively or negatively charged molecule, and the availability of correctly charged molecules of vital nutrients can vary, depending on the current conditions in the soil. For example, phosphorus is taken up by plants as a molecule called orthophosphate, which has a charge of either -1 or -2, meaning it has 1 or 2 extra electrons that will combine with a positively charged molecule if it encounters one in the soil. Phosphorus also can exist in the soil as phosphate, which has a charge of -3 and also very readily combines with positively charged molecules, particularly calcium (Ca^{2+}) in alkaline soils and iron (Fe^{3+}), aluminum (Al^{3+}) and manganese (Mn^{2+}) in acidic soils. The thing is, if a negatively charged nutrient interacts with a positively charged molecule, it becomes unavailable to the plant and stays bound up in the soil. So, if plants need to take up charged molecules, and charged molecules want to combine with oppositely charged molecules they encounter in the soil and therefore become unavailable to plants, how are plants able to find any charged, available molecules?

When a charged molecule combines with another molecule of opposite charge, the bond can range from being

very temporary to almost permanent, depending on the molecules and the conditions. Less permanent bonds allow nutrients to become bound and unbound, and in their unbound state they are available to crops. However, it is not just crops that seek these nutrients – soil microbes do as well. When a soil microorganism takes up a nutrient, it utilizes that nutrient temporarily and then excretes it as waste, or incorporates it into their body, releasing it only when the organism dies and decomposes. This process of releasing a nutrient is called mobilization.

Phosphorus: Because it is so inclined to bond with other positive molecules, there is generally not a lot of free phosphorus available in the soil at any given time: most of the available phosphorus is in the bodies of soil microorganisms. If the soil is warm and moist all year round, the soil microbes are living and dying and there is a fair amount of available phosphorus due to the continual turnover. If the soil is warm and moist and then suddenly gets much colder and/or drier, much of the phosphorus will not be available to crops until the microbe bodies containing it are decomposed (which happens at a slower rate in cold and/or dry soils). If the soil is generally not conducive to healthy microbial activity (too cold, too hot, too dry, too wet, and/or too compacted and lacking air), much less of the soil's phosphorus will be unavailable compared to the amount shown in the soil test results, and most of the phosphorus that should have been available through mobilization will be bound to positively charged molecules and unusable by plants. Thus, phosphorus availability is largely controlled by soil microbial activity and turnover. Those purple streaks in your corn leaves? Probably due to the soil being too cold, too hot, too dry, too wet, or too compacted. A soil test may show that phosphorus is there in the soil, but if you still get signs of deficiency, it's not available in a charged state that plants can take up.

Phosphorus availability can also be hindered by soil pH. When the soil pH is outside of the range of 6.5 to 7.5, phosphorus is inclined to bind to other soil minerals (iron, aluminum and calcium) and become unavailable to crops. Adding a pH adjuster like lime or elemental sulfur can help overcome this, and encouraging mycorrhizal associations also help crops take up available phosphorus in the soil. If phosphorus is deficient in the soil, adding rock phosphate or more readily available fish meal are options.

Nitrogen and Sulfur: Nitrogen and sulfur availability to plants is similarly controlled by microbial activity and turnover, but for opposite reasons. Where soil microbes help to keep phosphorus from being bound in the soil ...

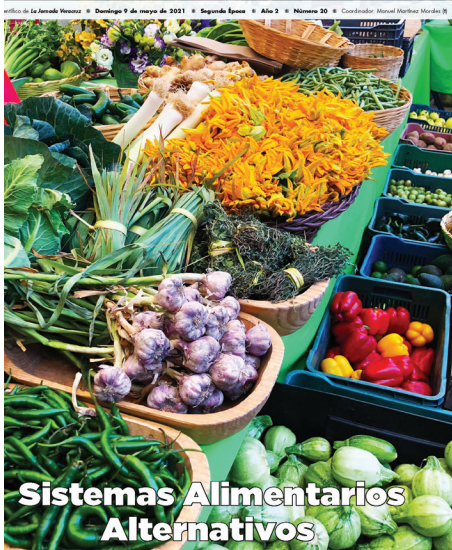
{...continued at growbiointensive.org/SoilScienceSpotlight}

ECOPOL: Article on GB Prison Garden in "La Jornada"

By ECOPOL Director Juan Manuel Martínez

ECOPOL Director Juan Manuel Martínez sent us the following letter and translation of a thoughtful and inspiring article from a prominent Mexican journal about the GROW BIOINTENSIVE method being used in a prison garden program. You can access the entire supplement in Spanish at bit.ly/ECOPOLLaJornada.

On May 9th, 2021, *La Jornada*—a Mexican newspaper distributed nationwide—published a supplement with several articles about organic agriculture and local markets that consume their products. The article on page 5 called “*From the Garden to Your Table*” by psychologist Helen Juárez talks about the garden located in the prison facilities of Ciudad Guzmán, Jalisco in which the prisoners are growing vegetables with the Biointensive Method. The article also talks about the impact the garden has on their diet and their spirit.



I taught three workshops there in 2019, and during the last workshop one of the participants said something that impressed me profoundly: “*When I work in the garden, I do not feel like a prisoner*”. In the translation of the article, we omitted some of the recipes the prisoners use to eat the garden’s products (you can

read them online). The article on page 6 talks about local markets—organized by the University of San Luis Potosí where I also taught some workshops—that sell organic products; some of the products sold there are part Biointensive.

Note: The laws and regulations of those establishments forbid the introduction of cameras or mobile phones, that is why we do not have pictures. To date the main garden has more than 40 beds and there are 12 prisoners who want to become certified teachers. This process was interrupted because of the pandemic and we will resume activities when it is over.

From the Garden to Your Table

Urban agriculture is an activity that during recent decades has been more and more present in multiple places, from gardens and terrace roofs to schools playgrounds and institutions. The art of producing your own food can come with original ways to add fresh food to your diet. An example of that is the therapeutic gardening project implemented by the University of Guadalajara in the Centro Integral de Justicia Regional de Ciudad Guzmán, Jalisco. This activity, under my supervision, is an extension university project that started in November of the year 2017.

Inside the penitentiary, our intervention takes place in the “Therapeutic Community”, a program inside the prison that focuses on the rehabilitation of the inmates who are trying to stop using drugs. Since our intervention started, we redesigned the areas that had the potential to produce in order to replace the system in which you sow in (rows), with beds to use the Biointensive Method. The efficiency of this method has made it possible to market the vegetable surplus and even to produce seeds. The money that comes from the sale of vegetables and seeds is used to meet the needs of the prisoners. The generous production of vegetables has had a positive impact on the people that have participated in this activity because now they eat more fresh food.

Arugula, kale, and mizuna are some of the crops that are here to stay. None of these plants were known, and for some their flavor, even when it was new, was also pleasant. Little by little these new crops conquered the palate of both the prisoners and the staff in charge of the area. Proof of this is that some of these crops have been incorporated harmoniously into some of the recipes that three people have shared with us. These people are currently participating in the “Therapeutic Community” program. To share this information, I have asked the authors for their authorization. For confidentiality reasons and with the purpose of safeguarding their identities, I have changed their names.

José describes in detail how he prepares his purple cauliflower ceviche (raw fish marinated in lemon juice). First, he places particular emphasis on the cooking point: “it has to be something in between, neither raw nor very cooked”. Once you have the right cooking point, you chop the cauliflower and marinate it with lemon, salt, Maggi™ sauce, and pepper. Then you chop the onion, tomatoes, green chili, coriander, and the carrots. Once all the ingredients are ready, you mix them and ready. José told us that when he prepared this recipe, most of the ingredients were taken from the garden. When we

asked him when had been the last time he had eaten that dish, he got quiet, tried to remember and said: “that was 9 years ago”. I also asked him how he felt when he tried this recipe again. He grinned from ear to ear, lowered his head a little and said: “It made me think of my grandma’s food”.

Other recipes shared by the inmates included a “Community Soup” of vegetables and pasta, and two different salads, one of mixed kale, arugula, chard, mizuna, and strawberries garnished with sour cream and peanuts, and the other of kale, chard, spinach, mizuna, tomato, beet, apple and guava dressed with mayonnaise and tuna. These recipes are an example of how our relationship with food goes beyond the simple fact of producing food and taking it to our tables. Our food is creativity, flavor, vitality, energy but it is also a way to preserve memory, emotions, and affections. If our dear readers have read up to these final words, we kindly invite you to prepare some of the recipes we shared here. Without doubt you will be surprised by the singularity of their flavors. If our readers do not know some of the crops here mentioned, then we invite you to visit the street markets and markets where local producers sell their crops; they usually have a bigger variety of noncommercial vegetables. If time and space allow it, we also invite you to make incursions into producing your own food. ●

*NEW in 2021! The Arabic translation of
How to Grow More Vegetables
is now available in electronic format!
Find it online at growbiointensive.org/HTGMVArabic*

ترجمة الطبيعة الخامسة
المتوقعة التي
طبع منها أكثر من
١٠٠٠ نسخة

كيف تنجح خضروات أكثر

كما كنت تظن انه صعب
وفي قطعة من الارض اصغر مما يمكن ان تتصور



جان جيوتز

Recipe: Strawberry Hibiscus Tea

By Shannon Joyner, Garden Companion Editor

Summer is almost here, and cooling drinks are beginning to sound good, sitting in the shade of a tree after a morning working in the garden. With COVID regulations relaxing in some areas, it might soon be possible to have a friend over to enjoy a tall glass of something nice, and if that's not a reason to celebrate, I don't know



Image: Shannon Joyner

what is! My favorite new drink combines bright hibiscus flowers and sweet summer strawberries for a refreshing tangy treat. Healthy (hibiscus is rich in vitamin C and antioxidants) and gorgeous (crimson hibiscus tea and red-pink strawberries make a vivid presentation), I think you'll love this drink from the first sip.

Ingredients

- 4 cups water
- 4 T dried hibiscus flowers
- 1 T cardamom pods, or 1/2 tsp ground spice
- Zest from 1 lime (long strips, not grated)
- 4 T maple syrup, honey, or sweetener to taste
- 2 cups frozen organic strawberries (can use fresh, but frozen helps chill the tea faster)
- Juice from 1/2 a lime
- 1 cup fresh strawberries, sliced (optional)
- 1 lime, sliced in rounds (optional)
- lemon balm sprigs for garnish (optional)

Boil the water, and add the hibiscus, cardamom, and lime zest, cover and steep for 30 minutes. Strain into a non-metallic bowl or pitcher. Place the tea in a blender with the frozen strawberries, lime juice, and sweetener, and puree until completely smooth. Strain it if you want a pulp-free tea, return to pitcher, and refrigerate until cold. Serve over ice, garnished with fresh strawberry and lime slices, and lemon balm sprigs, and enjoy! ●

ECOLOGY ACTION'S GARDEN COMPANION

EDITOR AND ART DIRECTOR: Shannon Joyner

CONTRIBUTORS: John Jeavons, Matt Drewno, Carol Vesecky, Michael Foley and Word of Mouth Magazine, John Beeby, Juan Manuel Martínez, EA Staff, and GROW BIOINTENSIVE® friends from around the world.

Ecology Action
5798 Ridgewood Road Willits, CA 95490-9730
Phone: (707) 459-0150

Ecology Action newsletters and full-length articles
are available online at
growbiointensive.org/Enewsletter/Archive.html

Printed with soy ink on 40% post-consumer paper

ECOLOGY ACTION EVENTS: 2021

Dear GROW BIOINTENSIVE Family,

In response to COVID-19, our schedule of public events is as follows, subject to change, as the situation progresses.

The *onsite* Fall 3-Day Workshop is canceled, but an *online* Zoom-based version will take place over three consecutive Saturdays: November 6, 13, and 20, 2021. Register at: growbiointensive.org/workshop.html

We are accepting applications for 2021 9-Saturdays course series II at VGFP: growbiointensive.org/9WeekCourse

Our 2021 schedule of events:
growbiointensive.org/events_main.html
or call 707-459-0150

Wishing everyone good health and good gardening,
Ecology Action

Ecology Action

5798 Ridgewood Road
Willits, CA 95490-9730



48 years.

152 countries.

Millions of people educated.
Millions of garden beds created.
Billions of pounds of
fertile soil grown...
And we're just getting started.

Grow Hope. Grow Abundance.
GROW BIOINTENSIVE®!

Your donations keep
us growing!
www.growbiointensive.org

Non-Profit Org.
U.S. Postage
PAID
Willits, CA
Permit No. 2

Address Service Requested