

ECOLOGY ACTION'S GARDEN COMPANION

GROW BIOINTENSIVE® News from Around the World



image: shannon joyner

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IN THIS ISSUE:

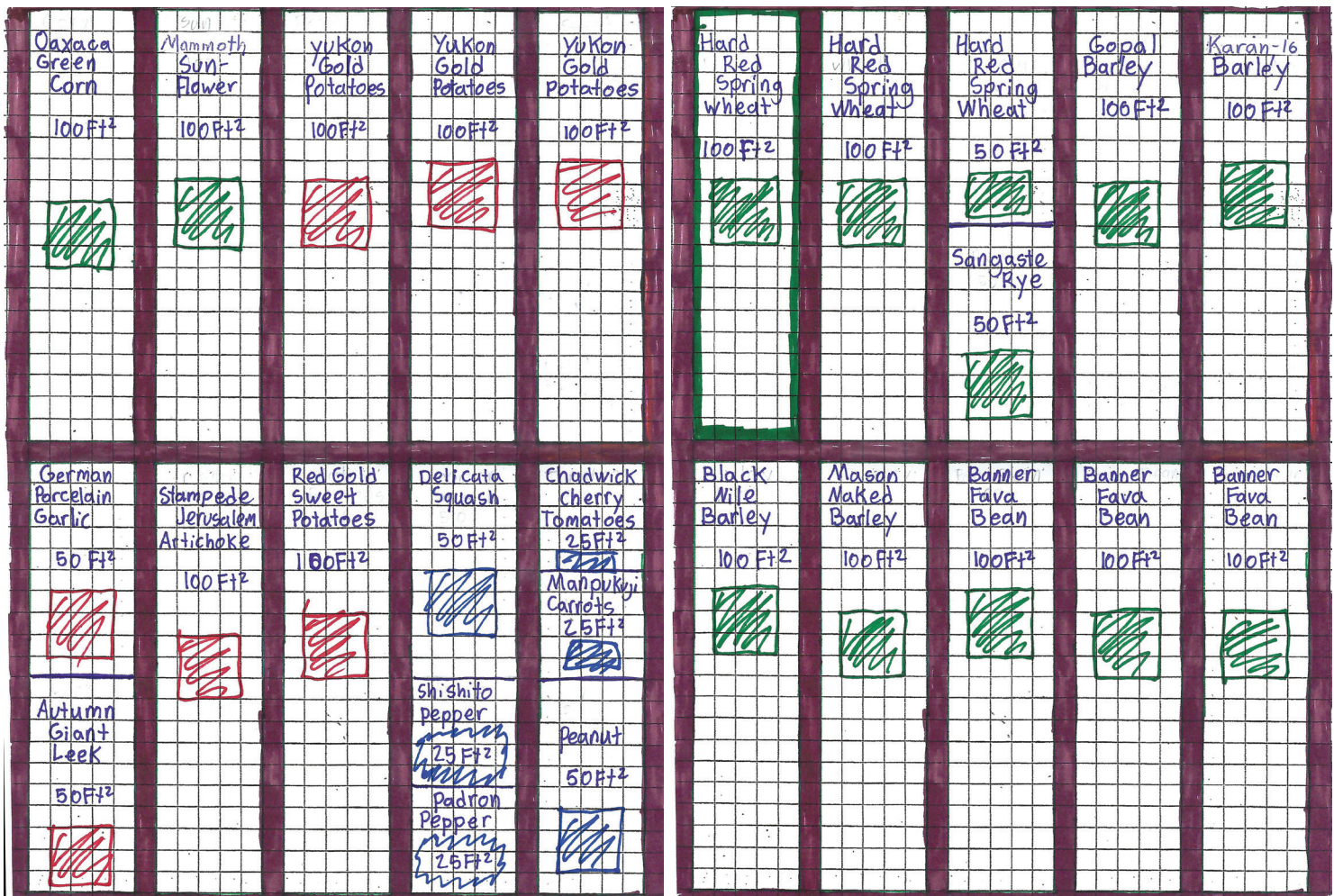
- THE JEAVONS CENTER MINI-FARM REPORT • VGFP: REFLECTIONS ON GROWING COASTAL • NEW VGFP STAFF: JAKE ELLSWORTH AND JANÉT MOORE • SOIL SCIENCE SPOTLIGHT: DR. JOHN DORAN/USDA SOIL QUALITY TEST KIT GUIDE • RECIPE: BUCKWHEAT WAFFLES • DAHLIA PROJECT UPDATE
- DIY: CLEANING RUSTY TOOLS • THE GUARDIAN: BUCKWHEAT RETURNS TO DUTCH FARMS • POSSIBLE SOLUTIONS: ELEPHANTS AND BEES
- BOUNTIFUL GARDENS ARCHIVE: GARDEN FOR YOUR CLIMATE
- EVENTS, OPPORTUNITIES...AND MORE!

The Jeavons Center Mini-Farm Report

By John Jeavons, Ecology Action Executive Director

With snow is thick on the ground at The Jeavons Center, it's a little hard to believe that spring is almost here, but the daffodils are blooming and before this storm, temperatures were close to 80°F, and gardeners and mini-farmers here in the Northern Hemisphere are enjoying the wintery pleasure of choosing the crops they'll grow in the coming season. At TJC, our Farmer/Teacher/Trainer Team (Melvin Castrillo, Suraya David Sadira, and Jessi Mickow) are preparing to plant their Complete Diet 10-Bed Unit micro-farm designs, based on many seasons' experience. They will also be planting four additional 100 sq ft growing beds with extra crops they want to learn from and/or especially enjoy eating more of!

To keep track of everything, the FTT team uses our detailed *52-Week Planning Chart* for each growing bed, which is laid out in three horizontal fields across the weeks of the year, to create schedules for Fall, Spring, and Catch-Crop seasons. It's easy to use: you just look at what needs to be done in a given week, and the schedule has already been set up (optimally for the entire year) the previous August. This type of long-term planning becomes possible when you work with your garden for several years and keep good records so you know what works, what doesn't, and when repetitive tasks need to be done each season. Experienced gardeners who want to use this system can find our *52-week Planning Chart* spreadsheet at growbiointensive.org/ePubs under the "featured downloads" tab, but for many beginning gardeners a less exhaustive planning approach may be more suitable. If you are looking for some simple but effective planning tools to get growing, the following resources may prove useful:



One of the 10-Bed-Unit designs (left: summer, right: winter) to be planted at TJC this season.

■ = 60% compost crops ■ = 30% calorie crops ■ = 10% income/micronutrient crops

The Common Ground Mini-Farm at The Jeavons Center, in February, before the snow arrived



Basic Planning and Planting Information

- In *The Sustainable Vegetable Garden* by John Jeavons and Carol Cox, Chapter 7: Planning and Planting Crops (pp 47-71) is especially useful, and includes simple planning chart templates you can fill in, a sample GROW BIOINTENSIVE (GB) Growing Bed Chart, and a Master Chart with planning information for many popular crops. On pp. 50-53, the *Sample Biointensive Bed Garden Plan for Willits* [available for free at growbiointensive.org/Enewsletter/Spring2023/samplegarden.pdf] is good basis for planning a garden almost anywhere as a first-time gardener, as the first eleven crops are the most popular in the U.S. (and popular in many other countries as well). The reason there are 11 crops rather than the usual "top 10" is because we include two types of onions for yields at both ends of the season: fast-growing green bunching onions to use fresh (or freeze) and slower-growing bulbing onions for storage. The *Sample Plan* shows the square footage of you need to grow an amount of each variety which, at reasonable yields, the average person will use of each crop annually. At beginning-level GB yields (assuming minimal soil fertility and farming skill) this 11-crop mini-garden can reach the desired annual yield goals in as little as 200 sq ft. At intermediate-level GB yields (with reasonable soil fertility and farmer skill) the same yields can be produced in as little as 100 sq ft.

As you become familiar with how your soil and skill-levels work with this plan, and the yields

your garden can reliably produce with these crops, you may decide to modify this basic garden plan to accommodate your preferences, climate, and culture. For example, in California, where more tomatoes are eaten compared with the average US diet, a mini-farmer might want to increase the area for tomato production. It's fun to try new varieties, and to hone your garden to produce what you and your family enjoy most.

- Another a key resource for planning and planting is *The Backyard Homestead, Mini-Farm and Garden Log Book* (growbiointensive.org/publications_main.html). Pages 148-150 provide a guide to determining the length of the growing season in your area, plus the temperature ranges involved. Page 151 notes the hours of direct sunlight needed for good plant growth. Pages 152-161 show the dates for starting in flats, direct sowing (although GB only recommends direct-sowing radishes and buckwheat), and transplanting seedlings for many crops, including grains, for both 90-day and 240-day growing season regions. The key dates can be adjusted according to your first frost date. Pages 161-189 provide a Planning Guide to help you create your own plan.
- In this issue of *The Garden Companion* (pp 14-15) we have advice and resources from the Bountiful Gardens archive to help with planning a garden around challenges that occur in different climates.

Happy Planning and Best Wishes from us all for a New Wonderful Gardening Year! ●

Victory Gardens for Peace: Reflections on Growing Coastal, Projections for the Year to Come

By Matt Drewno, VGFP Mini-Farm Manager

It's been a wonderfully cold and frosty winter here on the coast in Northern California. For most, such cold is unwelcome, but for us, we are grateful! Our climate tends to be cool and damp, and we rarely see frost during the coldest months, November through March. This condition encourages mold, rust, fungus, and other plant diseases which can flourish into the spring, most affecting our overwintering fava beans, *alliums*, and oat crops. This year, however, with temperatures dipping into the upper 20's (°F), we are seeing an immediate knock-back of these common coastal issues. Hooray for the cold!

And during the day, the sun comes up and immediately warms the garden. Winters tend to be our sunniest months on the coast; during the summer, the warming inland temperatures draw a cool marine layer of fog to the coast, which often persists through the months of June, July and August. Locals here jokingly refer to August as "Fog-ust" and June as "June-gloom". For seed savers like us, this creates challenging conditions to save our maturing seeds which often need a good dry summer warmth spell to finish. All growing climates are unique, but our coastal climate is special. The vast majority of temperate arable land is found away from oceans, in fertile plains and valleys which experience very cold winters and very warm summers: the opposite of what we have at VGFP. Our cool summers and mild winters provide many challenges and opportunities.



image: vgfpp

One of the biggest benefits our mild climate provides is that it is so completely easy and relaxing to work in. I almost feel guilty sometimes, that just four miles up the road, it may be 90-100°F, and although the tomatoes up there are likely much happier and more delicious, I'm down here on the coast wearing flannel, not even breaking a sweat. Perhaps more than guilty, I've become a bit of a softy—after growing here in this gentle climate for over 10 years now, I probably complain a lot more about the cold and the heat than I used to. I think I remember reading somewhere in an old book about growing climates around the world, that coastal climates like ours are the most productive for humanity. If I remember correctly, because coastal people spend less of our caloric energy warming and cooling our bodies, we are more effectively able to utilize calories to do the work of growing our food. So, not only do I feel a bit guilty, and am becoming soft, but I also tell myself how effectively I use my calories to produce my food in this climate! Good grief.

Anyways, I feel blessed. Victory Gardens for Peace is happy to be working with Janét Moore and Jake Ellsworth, our most recent staff additions (you can read about Jake on the next page and Janét on page 6). Francesca Mills, our local high school intern, is an amazing person. In about a month, we will be welcoming two 8-month onsite interns from Kenya, Clarice Wawuda Mwakudu and Eliakim Kipngetich. Both work with our partners in Africa and we welcome their arrival. It's wonderful to work with friends from other countries who are committed to helping their communities adapt and thrive with Bio-intensive agriculture. There is a camaraderie and dedication to the work that unites us in a way that is far beyond a normal classroom or educational environment. Through these bonds we strengthen our resolve, and with lasting friendship we find hope in each other's work and progress.

In this growing year to come, we welcome our new friends and neighbors. Our local programs are continuing to grow with educational partnerships blossoming with our local high schools and community college. Our seed bank is a gem, a curation of over 1,000 accessions, including over 30 varieties of locally grown quinoa, dozens of kales, peas, lettuces, barleys, corn, squash, and beans, and shelves overflowing with flower varieties that have been saved in our community.

New VGFP Staff: Jake Ellsworth

My name is Jake Ellsworth, and I hail from Milwaukee, WI. I moved to California in the summer of '22 after graduating from the University of Wisconsin-Milwaukee with a degree in architecture.

Ever since I was young, I wanted to be a farmer and a scientist, so naturally when I found *How to Grow More Vegetables* I fell in love. The concepts made so much sense, but the applications and practice were foreign to me, being just a kid from the suburbs. Soon after high school I traveled to New Zealand for six months to participate in WWOOF (World Wide Opportunities on Organic Farms, www.woof.org). There I saw biointensive and permaculture principals in practice that revealed the potential of local agriculture and the beauty of local ecology.

Returning to the States, I worked on several farms and attended Northeast Wisconsin Technical College, studying sustainable agriculture. Finding it not as academically rigorous as I hoped, I returned to Milwaukee seeking more, and found UW-Milwaukee's School of Architecture and Urban Planning. Architecture has always fascinated me and I saw it as a path that would challenge me in all the right ways. During my college career, I focused on designing for sustainability, participating in the national solar decathlon, for which my team was awarded 2nd place. However, designing for sustainability in an unsustainable system began to seem more and more a fool's errand, and worse, enabling the greenwashing of hardly "green" profits.

In this world of uncertainty, I believe that food sovereignty is the most important goal to strive for. Not only can localized and sustainable agriculture curb the degradation of the ecology of the planet, but it is also the first step to unweaving the rope of consumerism that binds us.

After working on over a dozen farms, attending school for sustainable agriculture, and countless hours of watching YouTube videos and reading books on the topic, the best method that I've found for achieving the goal of food sovereignty is GROW BIOINTENSIVE®. I couldn't be more excited to have the opportunity to study the method with Ecology Action and Victory Gardens for Peace, and teach it to as many people as will listen! ●



We care for these seeds and offer them free of charge to anyone in our community. We host seed bank and garden tours and offer scholarships to help participants attend our workshops and internships. The work ahead is about working together, celebrating the effort and letting nothing get in the way of what we know is possible in our hearts. The future is an open invitation to correct the course we're on, and to discover the fun in the process.

It's a blessing to work for Ecology Action. In the Ecology Action library, located at The Jeavons Center in Willits (a library more impressive than many agriculture sections in university libraries), there is a framed quote: *"Those who believe it cannot be done should step aside for those who are doing the work"*. That quote, which I first saw many years back, is etched in my mind. It continues to inspire me, and despite the challenges which come and go, keeps me focused. There is no doubt that the challenges we face in our rapidly changing world are great, but it's the vision that we hold on to as we work, of an equitable, peaceful, and sustainable world for all, that makes it happen.

From our little garden, perched on the cliffs of the Pacific Ocean we can hear the waves and smell the salty air. Our days are joyful and focused. We are a part of a growing tide of hope and inspiration. And throughout the mild growing season, even if we don't grow the greatest tomatoes, our kales, potatoes, barleys, leeks, and quinoa are delicious. And with a little love we can bring out the sweetness of it all. Wishing you the best of spring and summer this year, may your work be satisfying and the fruits of your labor be delicious! ●



New VGFP Staff: Janét Moore

Janét (pronounced Jeanette) Moore, VGFP's newest Farmer-Teacher Trainer, grew-up in Snohomish County, WA, north of Seattle, and is passionate about the environment and sustainable agriculture. As a teen she helped found the Sno-Isle Natural Food Co-op in Everett and started an organic market garden with her mom, selling produce to the co-op and local restaurants; they prepared the



soil by hand, using *How to Grow More Vegetables* to guide their farm design. Growing up on an organically rich, sponge-like peat bog in the ancient flood plain of the Snohomish River, Janét developed an appreciation for the world's dearth of fertile soil. Her love for nature developed as she

and her siblings played in the woods, gravel pits, and any open area they could find. Janét still seeks out natural places, hiking and camping often, and finds it brings her peace, and has been key to recovering from the consequences of a tumultuous childhood.

Janét spent time traveling the country, making and selling jewelry, then settled down as a single mother, working as a nursing assistant. While attending community college, she joined an environmental group, advocating for environmental reforms on campus and in her community. In 1999, she helped plan and participated in the World Trade Organization (WTO) protests in Seattle, heightening her understanding of issues such as workers' rights, sustainable economies, and the environmental/human rights failures of globalization. Also in 1999, Janét heard Dr. Elaine Ingham, a leading soil microbiologist, speak at a Washington Tilth Conference,

sparking enduring respect for the vital role of soil microbes in our world.

In 2006, Janét graduated from Utah State University with honors and a B.S. in Soil & Water Science, but was disappointed that the chemical farming perspective pervaded the department, largely ignoring the role of soil biology. After graduating, she worked for the USDA Natural Resource Conservation Service and US Forest Service, mapping soils in remote locations in Wyoming and Minnesota for several years.

In 2014, Janét and her son moved to Coos Bay, Oregon where she worked as produce manager at the local natural food co-op while serving as co-director of an all-volunteer environmental NPO, Coast Range Forest Watch. Using community science to survey for Marbled Murrelets (an endangered seabird), Janét helped halt old-growth logging in a state forest, advocating for timber policy reform, and increasing awareness of the importance of forest ecology. She gave presentations on the dangers of aerial herbicide spraying, a common timber industry practice in Oregon, and advocated for victims of spray drift. She also worked to organize community opposition to the largest potential source of pollution in Oregon, the failed Jordan Cove LNG export facility, as well as the proposed Coos Bay cargo-shipping terminals (another potential polluter), and other local environmental issues.

Currently, Janét is renewing her interest in sustainable agriculture and studying micromorphology (using microscopy to monitor soil health) in her spare time, through the Soil Food Web School founded by Dr. Ingham. She is happy to join Ecology Action and focus on understanding the closed-loop sustainable mini-farming GROW BIOINTENSIVE method, to grow healthy food while growing soil, and to be part of long-term research into truly sustainable practices. She is excited to work at VGFP with a network of bioregional seed savers, working together to preserve genetic diversity for our future security. She appreciates the opportunity to learn to design and grow a complete vegan diet in the smallest space possible, and believes that it is increasingly important that more people avail themselves of this critical skill-set developed by Ecology Action, in light of resource scarcity. She says that GB is beautiful because, *"it's a tried-and-true way for people almost anywhere to meet most, if not all, of their dietary needs, while building soil organic matter and saving water, using only simple hand tools."* ●

Soil Science Spotlight: The Dr. John Doran/ USDA Soil Quality Test Kit Guide, Part 1

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

Soil testing and the correct use of organic 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. Read the whole series at growbiointensive.org in the “Protocols” section.

Do you want to learn how to understand and improve a soil even if you don't have access to a soil laboratory and a professional to interpret the results? Read on!

If you think of soil analysis as being like a 3-legged stool, supported equally by biology, chemistry, and physics, you'll understand that emphasizing the use of one of the legs over the others prevents a full, “stable” understanding of the state of the soil and what it needs to become healthier and more fertile. Probably since the beginning of agriculture, there would have been some understanding of soil physics. To germinate a seed to grow into a harvestable crop, early farmers would have learned not to plant in extremely crusted over or compacted soil, as the germinated seed would simply die on the soil surface. Later, there was some understanding of the importance of tilling, which could be improved by adding organic matter. Later, our understanding of soil chemistry developed, allowing us to measure soil nutrients and know how to meet the chemical needs of soils and crops. More recently, the importance of soil biology, not only to soil health but also to soil chemistry and physics, is becoming clear. We have developed advanced technology that reveals the incredible diversity of life within the soil and emphasizes how little we know about what all these creatures actually do! It is estimated that we have identified less than 1% of soil bacteria and fungi; of those we have identified, we know very little about the function they serve within the complex soil ecosystem.

Because each soil is unique, to work successfully with it, we must first try to understand all three of its “legs”—the soil's physical, chemical, and biological attributes. Each soil is unique just as each person is unique. Only by knowing a soil's strengths and weaknesses can we attempt to improve it. There is no “one-size-fits-all” miracle fertilizer or amendment that is beneficial to all soils. If you don't understand your soil, you could just as easily harm it as benefit it by adding the wrong amendment.

The USDA *Soil Quality Test Kit Guide*, developed by Dr. John Doran, is one set of tools that considers a soil's physical, chemical, and biological properties to give you a wholistic understanding of a soil. Dr. Doran is a famous scientist whose work contributed greatly to our understanding of soils, soil organic matter, and soil health. He was a past president of the Soil Science Society of America, and was awarded many honors, including the Onassis International Prize for the Environment. Dr. Doran's guide describes how to carry out 12 different tests to develop a comprehensive understanding of a soil's chemical, physical, and biological status, using simple, affordable equipment. While not a direct substitute for soil laboratory testing (as it does not provide quantifiable levels of soil nutrients), in some ways it goes beyond a standard test by providing critical information on the soil's quality that affects its health and fertility not available through a soil testing laboratory. The *Guide* describes the procedures to conduct each test, shows you how to interpret your results to improve your soil, and is available for free, online, in both English and Spanish at bit.ly/DoranSoilTest.

The *Guide* describes the following tests: **soil respiration, infiltration, bulk density, electrical conductivity, pH, nitrate, aggregate stability, slaking, earthworms, physical observations, and water quality.** This *Soil Science Spotlight* series will be devoted to understanding all the information that can be deduced from each of these tests, as well from the combination of tests. It is particularly the combination of test results that is powerful as it provides quite a thorough understanding of a soil and how to improve it. **But to reiterate:** while the tests described in the *Guide* can provide valuable insights into a soil that a soil lab test cannot, and can help farmers who lack access to a soil testing laboratory to understand and improve their soil, it is not a substitute for a soil laboratory test and does not provide quantitative values of available soil nutrients. Please get a soil lab test performed if possible, and be very cautious when using the *Guide*, making sure you're not drawing conclusions for which you don't have enough evidence. In Part 2 of this series, I will provide an overview of the tests in the *Guide*, and how they can be used to understand your soil. ●



Recipe: Snowy Day Buckwheat Waffles (Vegan, Gluten Free)

By Shannon Joyner, Garden Companion Editor

It's been a cold, wet, fierce winter here in Northern California. As I write this, I'm snowed in from back to back storms that have doused the state from the Oregon border to the Hollywood sign. Snow isn't my favorite form of precipitation, but these storms are filling up our aquifers and soaking into our drought-parched soils, so I'm not complaining! Being snowed in somehow gives everything a weekend vibe, and what's more "weekendy" than waffles? I had some buckwheat flour in the pantry, so I thought I'd try adapting the recipe at cookie-andkate.com/gluten-free-buckwheat-waffles to be vegan, and this is what I came up with. These waffles aren't a disappointment: they're crispy-tender, have a sweet wholesome flavor from the whole grains and the pumpkin spice, and hot off the waffle iron they go really well with maple syrup and blueberries, a strong cup of coffee, and a snowy wonderland outside the window. I like the texture soy milk gives, but you can use any nondairy milk you prefer. Just be aware that different milks have different water content, so you may need to adjust the amount to get a nice batter consistency - I'd start with one cup and work your way up to avoid getting watery batter. If you're not feeling vegan today, you can use an egg in place of the flax/water mixture, and buttermilk in place of the milk and vinegar.

Ingredients (~2-3 servings)

1.5 T flaxseed meal
3.5 T warm water
1 ½ c unsweetened soy milk
2 t apple cider vinegar
1 cup buckwheat flour
3 T oat flour
1 T sugar
1 ½ t baking powder
1 t baking soda
¼ t salt
½ t pumpkin spice
¼ c sunflower oil

In a small bowl, mix the flax meal and the water.

Stir well, and allow it to sit for 10 minutes to thicken. In another small bowl mix the soy milk and vinegar. Stir well and allow it to sit for 10 minutes.

Preheat your waffle iron.

In a medium-sized mixing bowl, whisk together the buckwheat flour, oat flour, sugar, baking powder, baking soda, salt, and pumpkin spice. Add the oil, the flax mixture, and the soy milk mixture to the dry ingredients and mix thoroughly. Allow the batter to rest for 10 minutes to give the flour time to absorb the liquids. Give the batter another stir, and then spoon it onto the hot, oiled waffle iron plates, close the top, and cook until the waffles are done (I use about ¼ cup of batter for each waffle, but that and the time it takes to cook will vary depending on your waffle iron; they will be golden brown and lightly crispy to the touch when they're done).

Carefully remove the waffle from the hot iron and serve immediately, topped with butter, nut butter, fruit, syrup, jam, honey, or whatever makes your mouth happy! Leftover waffles can be frozen and reheat well in the toaster. ●



image: shannon joyner



image: ugfp

Dahlia Project Update

By Suraya David-Sadira

FTT and Assistant Mini-Farm Manager, TJC

In 2021, we established an experimental 10-Bed Unit at The Jeavons Center with a diet design including dahlias as a versatile carbon/calorie/income crop. This is part four in a five-part series on this project.

Here at TJC we are excited that it is beginning to show signs of spring. Roses are budding, tubers are sprouting, winter crop growth is speeding up, and we are starting to flat our brassicas. I thought I'd give a little update on how the dahlia storage has gone so far and discuss how we will be structuring further research on the dahlia varieties.

I'm happy to report that our new storage technique is a success. Last season, we stored the tubers in cardboard boxes, spraying them with water when they dried out, with mixed results. This time, we stored them in sealed plastic bags, surrounded by shredded office paper, as it was what we had available. I believe coco coir would have worked just as well, and I suspect whatever dry papery substrate you have around (dried grass/leaves, etc.) would work too. When I inspected them on February 10th, all of the tubers were looking wonderfully healthy!!



Building our dahlia cultivation skills and observing different growing methods over the past two years, we have come to understand their preferred growing conditions. This year, we will begin expanding the experiment to test which varieties produce the most biomass, flowers, and edible tubers. From the varieties we have grown so far, we will choose 4-6 varieties and grow 25-50 sq ft of each. Decreasing the number of varieties grown and increasing the growing area for each tuber will allow us to gather specific data on each variety. We will keep detailed records to assess which variety can produce the greatest amount of calories, compost material, and income. I look forward to providing you with more findings as the season progresses. If you are interested in keeping data on your favorite dahlia variety and want to share your findings with us, please reach out to Suraya-sadira.ecologyaction@gmail.com and I will send you a data sheet and instructions on how to follow our data gathering guidelines. ●

"We have neglected the truth that a good farmer is a craftsman of the highest order, a kind of artist."

~Wendell Berry

DIY: Cleaning Rusty Tools

By Shannon Joyner, Garden Companion Editor

We've all done it: forgotten a tool out in the garden, only to find it months (erm, years?) later, fused with dirt and corrosion, crusty, unusable, and sad. This weekend, cleaning out a shed, I found a bonanza of abandoned hand tools, claggy with rust: an adjustable crescent wrench that wouldn't adjust, a pair of fused pliers, a sad set of pruning shears, and locked-up needle-nosed pliers.

Looking at the state of them, it was tempting to give up and send them to the great tool shed in the sky. But... I really didn't want to. They are (or were) quality tools which should really last a lifetime, and they're expensive to replace! I wanted to salvage them but wasn't sure where to start. While there are plenty of commercial rust removers available, I wanted something that wasn't caustic or toxic; I didn't want to spend a lot of time sanding and scraping the tools, or a lot of money buying cleaning solutions. So, a cup of tea and a web search later, what I found (thank you internet hive-mind) was a "miracle cure" in the form of a simple soak in vinegar and salt. It seemed too easy to be true, but I had all the ingredients on hand, and the tools couldn't get any worse, so I tried it out. And guess what? IT WORKED!

I mixed distilled white vinegar (5% acidity) and table salt at a 16:1 ratio (1 T salt to 1 cup of vinegar) in a plastic container (use only nonreactive plastic or glass containers for this part). I only made enough to cover my tools up to the neck of the handle because I wasn't sure it would work and didn't want to use all my vinegar, but next time I'll make more and use a larger container to cover the handles as well.

I placed my rusty tools in the vinegar/salt solution and left them there for 36 hours. Then, using rubber gloves, I removed the tools from the acid bath (the acid is mild, but it won't be kind to your skin, and liquefied rust can stain your fingers and anything else it touches including countertops, clothes, and sinks so use gloves and caution). The rust was flaking off; I dipped an old toothbrush in baking soda and a good scrub removed most of it. Next, to neutralize the acid so it didn't continue to interact with the metal and damage it (any more than the rust had already done), I soaked the tools in a 16:1 water/baking soda mixture for 10 minutes.

While I was waiting for the tools to soak, I mixed a few tablespoons of baking soda into the used vine-

gar/salt solution to neutralize the acid, waited for it to stop foaming, then poured it down the drain and rinsed well to remove any residue (nothing in the solution is toxic: vinegar, salt, water, baking soda, and a bit of iron from the rust that flaked off won't harm the environment, but the rust can discolor surfaces so be careful!) Then, I removed the tools from the neutralizing solution (baking soda is nontoxic, just pour it down the drain), scrubbed any remaining stubborn rust with a bit of steel wool, rinsed the tools in water, dried them thoroughly, and finished with a light coat of lubricating oil to help prevent any more rust from setting in. I used boiled linseed oil because I wanted something non-toxic, but you could use any lubricating oil you're comfortable with.

And just like that! I have a lovely set of clean, usable tools, and maybe I'll even remember to put them away when I use them...

LOL. Okay, maybe not. But at least now I know how to get them back in shape when I leave them out, using a simple, inexpensive, planet-friendly method. And now, so do you! ●

IMPORTANT NOTE: While the 36 hour vinegar/salt soak will not harm steel, it can corrode aluminum. If your rusty tools have any aluminum parts, only leave them in the acid bath for a short time and monitor them closely. This is critical when dealing with threaded aluminum parts, as threads are delicate can get eaten away by acid very quickly. As always, when in doubt, don't experiment on tools you can't afford to lose or damage (this goes for surfaces, too)!



The Guardian: Buckwheat Returns to Dutch Farms

The following is an excerpt of an article published in The Guardian in October 2022 which you can read in its entirety at <https://www.theguardian.com/environment/2022/oct/14/gluten-free-and-insect-friendly-buckwheat-returns-to-dutch-farms-aoe>. Although we do not encourage the monocropping model, we are sharing this article because it highlights the value of protecting and enhancing native pollinator health and biodiversity in our food web by bringing back traditional crops (such as buckwheat) that have been replaced by the more commercially popular varieties. GB helps small farmers grow biodiverse and pollinator friendly gardens, and encourages the use of buckwheat as a cover-crop and/or a grain crop.

Organic farmer Kees Sijbenga looks at the sea of white and pale pink blossoms before him. It is mid-July and millions of tiny buckwheat (*Fagopyrum esculentum*) flowers sway in the wind on the plot he is cultivating in the Dutch province of Drenthe. Sijbenga is delighted that the crop is buzzing with a multitude of insect pollinators. “I’m so happy to be growing buckwheat,” says the third-generation farmer.

Sijbenga is one of 23 farmers in the provinces of Groningen and Drenthe in the north-east of the Netherlands who are part of an ambitious, nature-inclusive agricultural project to re-establish buckwheat farming in the country.

Buckwheat flour, made from the seeds of the plant, is a key ingredient in popular Dutch foods such as *pannenkoeken* (thin, flat pancakes) and *poffertjes* (fluffy mini-pancakes), but almost all of the flour is imported. “At the beginning of the 19th century, buckwheat was the second-largest crop grown in the country, after rye,” says Peter Brul, an organic farming adviser. “It was a staple food in the country at that time.”

But with increasing access to synthetic fertilisers in the 20th century, farmers moved to more high-yield and lucrative crops. “Potatoes became the staple food, and buckwheat cultivation completely disappeared,” says Brul.

In 2019, Brul embarked on a serious effort to revive the cultivation of buckwheat in the Netherlands. The fact it is gluten free, and rich in antioxidants and high in fibre has boosted the market for it, but Brul’s

efforts are also spurred by its reputation as a pollinator-friendly crop. More than half of the Netherlands’ bee species are endangered, and pollinator-friendly agriculture is crucial to their conservation.

In a pilot four years ago, a farmer in Groningen cultivated buckwheat on a one-hectare plot with Brul’s guidance. The experiment was deemed a success and now 23 farmers are producing the crop on 85 hectares scattered across Groningen and Drenthe. “What has worked well so far, is that farmers are interested and we could expand the programme,” says Brul.

Buckwheat, a summer crop, grows well in the poor, sandy soils of the eastern Netherlands. The crop has few known pests or diseases though it is extremely sensitive to frost – in 2021, each cultivated hectare yielded an average of 1,750kg of seeds (with hull), slightly lower than the target of 2,000kg, mainly due to poor weather conditions during flowering.

Buckwheat also makes for a great cover crop, enhancing the health of the soil, while its dense canopy suppresses weeds. On the same plot, farmers like Sijbenga grow a cereal, mostly wheat, in winter, followed by potatoes, sugar beets, or other vegetables in spring.

In summer, Sijbenga grows buckwheat in strips, alongside other biodiversity-friendly crops such as peas and lupines (grown for their beans). The seeds are sown in mid-May and begin to flower just over a month later. The rich nectar produced by the millions of flowers attracts huge numbers of honeybees and wild pollinators. The long flowering period – lasting until it is harvested in late August – ensures a steady supply of food for the insects, especially at a time when nectar can be scarce in agricultural areas.

Thijs Fijen, an assistant professor at Wageningen University in the Netherlands, has studied the insect diversity in these buckwheat fields. “According to our research, at any given moment during peak flowering, one hectare of the buckwheat field has an average of 6,500 wild pollinators, accounting for 51% of all pollinators present,” he says. “This includes 28 species of hoverfly, 12 species of wild bee and 13 species of butterfly.” The remaining 49% of pollinators are honeybees.

Fijen and his colleagues observed that honeybees are drawn to the buckwheat fields, leaving surrounding areas available to wild pollinators and reducing the competition they face for food. “This shows the tremendous potential of buckwheat cultivation for biodiversity conservation in agricultural landscapes,” says Fijen. ...●

Possible Solutions: Elephants and Bees

By Shannon Joyner, Garden Companion Editor

Mlesh Mlegwa, Director of our partner organization Garden of Hope CBO (a grassroots non-profit organization in Taita Taveta County, Kenya) wrote to us of the difficulty he and the small-scale farmers he trains to use GROW BIOINTENSIVE are encountering from hungry elephants foraging in their gardens: *“We resumed our normal Mbulia farmer’s field meetings on the last week of January with an analysis of the elapsed season. The season has been marred by a lot of challenges like stressed rainfall and continued living with wild animals like the elephants. These have destroyed the few crops people have managed to salvage from severe weather, and some members did not harvest anything due harsh weather and as for others, their little produce was destroyed by elephants.”*

In a region enduring an extreme ongoing drought, encounters with wildlife desperately seeking food and water are a real problem for the people living in elephant territory like Taita



Sweet potato plants productive despite the drought at Garden of Hope, destroyed by hungry elephants.

Taveta County. Many farmers rely exclusively on the food they grow to feed their families and to earn an income, so elephants eating their harvests and destroying plants they have worked so hard to grow is a very serious issue. And human/elephant encounters are dangerous for both: elephants can easily injure or kill a human in their quest for food, and endangered elephants can be injured or killed by people trying to defend their crops.

When I heard about Mlesh’s difficulties with elephants, I remembered an interesting article I’d read about how some Kenyan farmers having similar problems are using strategically placed beehives to deter elephants from coming into their gardens. The article (amusingplanet.com/2016/08/bee-hive-fences-using-bees-to-keep.html) states:

“This so called ‘bee-hive fence’ was first deployed as a test in Kenyan farms by a charity organization called ‘Save the Elephants.’ Farms were fenced off by nine beehives hung under small, thatched roofs. Each beehive was placed ten meters apart and were linked together by wire. Researchers found that farms protected by beehives had far less human-elephant conflict than unprotected farms. ... The fences are easy to make using only locally sourced materials, and they cost a fraction compared to the cost of concrete barriers and electrified fences. Even with the hives empty of bees, elephants are wary of nearing them as the smell of the hives is enough a deterrent. The hives are connected by wires so that if an elephant tries to cross the barrier, the interconnecting wire shakes the hives releasing the bees. The resident communities also benefit from the bees, through the harvest and sale of honey. Pollination work of the bees can also increase biodiversity and even increase the yield of the crop that they protect. Researchers are not sure why elephants are scared of bees, because an elephant’s skin is too thick for bees to cause any damage. But there are areas where bees can and do sting elephants, for example, around eyes and inside of the trunk. It’s possible that elephants avoid bees to prevent such an experience.”

A little more research revealed that the *Save the Bees* organization mentioned in the article promotes the use of beehive fences among

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Kenyan farmers through *The Elephants and Bees Project* (elephantsandbees.com/kenya), which I thought might be useful to Mlesh if he decides to try putting a beehive fence in, especially since the organization is located relatively close to Garden of Hope. Their website states that “*The Elephants and Bees Project is part of the Save the Elephants’ Human Elephant Coexistence Program, based in Sagalla, Kenya, next to Tsavo National Park. Our award-winning project explores the use of Beehive Fences as a natural elephant deterrent, helping protect farmers and farmland. The idea is based on our innovative research using elephants’ fear of African honeybees to help reduce crop-damage and minimize other human-elephant conflict incidences. A win-win addition to a toolbox of deterrent methods, beehive fences help create a social and economic boost to farmers through pollination services and the harvesting of ‘Elephant-Friendly Honey’.*”



***A Langstroth beehive fence line in Tsavo
Image credit: Save the Elephants***

We wrote to Mlesh to let him know about this possible resource and he was enthusiastic: “*I am happy and thankful to hear about this important approach that's reducing human-wildlife conflicts amicably. The problem is currently rampant to my community, as all the elephants have left the [Tsavo National Park]*

and are living in the community. The little farm produce which is left by the scorching sun is consumed by the elephants, and people are not sleeping at night because they have to keep watch to guard their crops. At our farm, we have experimented with planting chilies/hot peppers around the garden beds, but it works as a deterrent only when the elephant accidentally eats a chili with another palatable crop. “Elephants and Bees” is an exciting project and fortunately is in my VOI sub county. Please put me in touch with them, as I would like my farm to be a demonstration garden for this project. If it is a success, it will help thousands of community members who are currently spending sleepless nights like us due to the perennial problem of human-wildlife conflicts. Thank you so much once more.”

Luckily, *Elephants and Bees* offers training very much along the lines of the GROW BIOINTENSIVE farmer-leader training programs we and our partners offer, where people can learn the techniques, and are encouraged to take them back to their communities to propagate: “... *for people who wish to come to the Elephants and Bees Research Centre and fully engage with the project, enabling them to return to their own communities or to those they are working with and implementing the effective beehive fence as an elephant deterrent. We can host training visitors (from Kenya or other HEC hotspots in across Africa & Asia) from a few days up to 2 weeks to be fully submersed in how the project works. Our staff team, led by our Beehive Fence Training Officer, are experts on beehive fences and the struggles of living with elephants and will give you a thorough insight into how the E&B project works and the beehive fences as an elephant mitigation in order for you to return to your own HEC sites with the best potential to alleviate the conflict. To find out more about the beehive fence training please get in touch with us.*”

We're going to try to help Mlesh get in touch with the project, where hopefully, he can get the training he needs to use beehives to protect his crops, make honey, and teach others to do the same, so the elephants and humans can coexist peacefully. If you would like to make a donation to Mlesh’s project to help make this happen you can do so at <https://donatenow.networkforgood.org/gardenofhope> •

You can change your soil, but not your climate. Strange, then, that gardening books often ignore it, assuming the seasonal cycle at the author's home to be "normal." Successful gardeners adapt by planting what grows best where they live, and by using cultural practices that create the microclimate their plants need. Below are tips for your climate, and resources to learn more. There's a list of popular vegetables, with varieties adapted to each climate. The suggestions are limited by space and our experience. Climate types are based on growing season, so winter possibilities vary.

Hot and Wet: The priority is to prevent disease by ensuring good air circulation, and good cultural practices. Plants will grow and use nutrients quickly, so keep them well fed with compost, and get a soil test.

Start with the soil: good drainage allows air to supply your plants' roots with oxygen, and prevent root rot. Beds raised above the rest of the garden will drain better. Adding compost lightens the soil, allows for air pockets, and increases the diversity of soil micro-life, keeping it in balance. Consider using inoculants of beneficial fungi and bacteria to increase this effect.

Rotate crops to keep the soil from harboring disease/pests. The basic plant families are: cabbage/kale; potato/tomato; squash/melon; grain/corn; spinach/beet; pea/bean; carrot/parsley; and lettuce/endive. The plants in each family share diseases and pests, so avoid growing them in the same spot two years running. Herbs and flowers scattered around the garden help deter pests too. Make sure plant wastes are hot-composted at the end of the season, to kill disease spores and overwintering pests.

In planting, use wider spacing and keep the beds weeded to improve air circulation. Don't enclose your garden too much: let breezes in and out. Trellis climbers and tomatoes well, and keep the bottom 12-18" free of leaves. A light mulch will prevent spore-laden soil from splashing on plants during watering. Weekly spraying with compost tea prevents disease and adds nutrients.

Beans *green:* Rattlesnake, Yard-Long, Lima, runners
dry: black-eyed peas, Lima, Black Turtle

Corn *sweet:* Country Gentleman, Golden Bantam
dry: Floriani, Painted Mountain

Greens mustards, collards, Malabar/Egyptian spinach, orach, purslane, arugula, chard

Lettuce Merlot, Anuenue, Buttercrunch, Jericho, Bronze Arrow, Grandpa Admire's Dark Green Romaine

Squash *summer:* Tromboncino, Yellow Crookneck
winter: Butternut, Musque Provence (Fairytale)

Tomato Homestead 24, Eva Purple Ball, Matt's Wild, Arkansas Traveler

Try: okra, eggplant, cucumbers, habanero peppers

Winter: kale, collards, arugula, mustards, cabbage, endive/chicory, winter lettuce, cabbage, garlic

Resources:

Guide to Vegetable Gardening in the Southeast by Ira Wallace; *Good Bug, Bad Bug*, by Jessica Walliser; *Perennial Vegetables* by Eric Toensmeier

Cold and Dry: The priority is to ensure enough moisture and warmth. Getting moisture into the plants and keeping them from losing it requires watchfulness and strategy. Soil life is likely to be limited by both cold and drought. Inoculating with beneficial fungi and bacteria will help, but you must provide soil organisms with food (compost, mulch) and water to create a diverse and productive soil community. Compost tea contains it all. The life in the soil will feed your plants.

Earthen walls, swales—even little furrows, bands of mulch, or buried wood—can harvest water and create warmer microclimates to transform a dry barren spot. See resources.

Most cold and dry places are in the mountains, and have short growing seasons. Plant shelters and protection like coldframes, hoopouses, and row covers really come into their own here. Short-season varieties are key, also. Mulch can retain heat at the end of a warm spell, but if the soil hasn't warmed up, mulch can shade it too much.

Shelter from wind is critical. Hedges, walls, buildings, and temporary barriers (even cardboard) prevent wind chill for your plants just as they do for you. Create sun traps, open to the sun in the south but enclosed to trap heat. Rock (or water barrels) can be a gardener's best friend in this climate, storing heat in the day to radiate it at night. Terraces and walls can create a microclimate like moving to another climate zone. Make walls (rock/wood/soil) that wiggle, and plant in niches created by the curves.

Beans *green:* Contender, favas, Blue Lake
dry: Nodak Pinto, Beefy Resilient, favas

Corn *sweet:* Little Giant
dry: Painted Mtn, Mandan Bride, Roy's Calais

Greens chard, kale, mustard, sylvetta, chickory, mache spinach, Aztec spinach

Lettuce Bronze Arrow, Chadwick's Rodan, Merlot, Winter Density, Arctic King

Squash *summer:* Dark Star
winter: Buttercup, Lower Salmon River, Acorn

Tomato Glacier, Stupice, Amish Paste, Black Krim

Try: Asparagus, rutabaga, beets, parsnips, carrots, peas, dry peas instead of dry beans, chimayo peppers

Winter: kale, winter grains, mache, garlic, spinach, chard, minutina, sylvetta, miner's lettuce

Resources:

Desert or Paradise by Sepp Holtzer; *Sepp Holtzer's Permaculture* by Sepp Holtzer; *Rainwater Harvesting* by Brad Lancaster; *Four-season Harvest* by Eliot Coleman

Cold and Wet: The priority is to ensure enough air and heat—both around the plants and in the soil. To warm your soil, plant on mounds, scooping soil from the paths to make beds higher. More drainage means warmer soil. In a truly cold-summer climate, like Alaska, use narrower beds so they warm up faster. Instead of a 4' or 5' wide bed, try making them 2' wide. Research in Alaska shows increased plant growth in beds 28" wide or less.

Hot beds are an ancient soil-warming technique worth learning. Simply dig out a sunken area at least 4' x 4' (or enclose the area with boards); this size creates enough mass for heat to build up. Save the topsoil. Build a compost pile 2-3' high in the pit using any organic debris that will rot and heat up: weeds, grass, straw, household food waste, seaweed, shredded leaves, etc. Make sure it is moist, and top with 6-8" of topsoil, which you plant into. Enclose with a cold frame or clear tent for better results.

Soil aeration is important in a high rainfall climate. Raindrops compact the soil as they strike; once soil is compacted, you need to fork it over to fluff it up. If you cover it with thick organic mulch all winter, earthworms will fluff it for you. Heavy winter mulch also prevents erosion and frost heaving, but pull it off in the spring so the sun can warm the soil. Adding compost will lighten soil texture and allow air and biological activity to warm things up.

To ensure heat around the plants, there are many forms of shelter: greenhouses, hoopouses, row covers, and our favorite, cold frames (they're portable, have little disease buildup, work with hotbeds, and avoid plastic if the covers are glass). Plants stay in vegetative growth longer in cool weather and will get bigger. They need air circulation all around them to prevent fungus diseases, so use spacing from 1½ to 2 times what is normally recommended.

Beans *green:* Blue Lake, Scarlet Runner, favas
dry: Beefy Resilient, Nodak Pinto, Scarlet Runner

Corn *sweet:* Little Giant, Tuxana, Top Hat

dry: Painted Mtn, Magic Manna, Cascade R-G

Greens all Asian greens, mustards, spinach, kale, cabbage

Lettuce Emerald Fan, Black-Seeded-Simpson, Goldring, Winter Density, Hungarian, Bronze Arrow

Squash *summer:* Bennings, Black Beauty, Costata
winter: Acorn, Buttercup

Tomato Stupice, Glacier, Black Krim, Amish Paste

Try: all greens, peas, favas, turnips, cabbage, perennial veg, mushrooms kits, dry peas instead of dry beans

Winter: kale, cabbage, Asian greens, overwintering onions, winter lettuces, endive, sprouting broccoli

Resources:

Gardening for Self-Sufficiency by John Seymour; *Salad Leaves for All Seasons* by Charles Dowding; *Sepp Holtzer's Permaculture* by Sepp Holtzer; *The Resilient Farm and Homestead* by Ben Falk; *The Resilient Gardener* by Carol Deppe; *Essential Guide to Radical, Self-Reliant Gardening* by Will Bonsall

Hot and Dry: The priority is to retain water—in the soil, in plant tissues, and deep in the ground. Organic matter is key to retaining soil moisture; it holds water in humus, yet allows life-giving oxygen, which watering can exclude. Mulch also holds soil-water by preventing evaporation. In hot places with cool nights, try stone mulch: fist-sized rocks shade the soil, slow evaporation, radiate the day's heat at night to help crops ripen, and add moisture to the soil from the dew that condenses on them.

To retain water in plants, protect them from wind, which can double water requirements. A hedge or belt of fruit trees to the windward side of your garden will help, as will light fencing (reed, bamboo, even cloth or dead branches). Even peppers and tomatoes stop growing/setting fruit over 90°F. If you have intense summer heat, plants will appreciate shelter from the midday sun. Site leafy crops on the east side of taller crops or buildings so they get morning sun only; position tall crops like corn so shorter vegetables get an hour or two of shade between noon and 4pm, or use shade cloth. Trees that cast light shade are helpful, and if they are nitrogen fixers like Honey locust or mesquite, they won't rob vegetables of nutrients.

Plant roots go deep if they can, and deep water is the key to self-sustaining landscapes. Earthworks like swales, hügelkultur, or sunken beds really pay off here (see Resources below). To make a fertile sunken bed, remove and save the topsoil first, then remove a layer of subsoil, then replace the topsoil, well amended with compost. Or build a dike or berm around your beds to retain water.

In a summer-dry/winter-wet climate, use water when you have it: keep your garden full of growing crops during winter rains. Start spring crops early while there is moisture and the weather is gentle. Row covers, hoopouses, or cold frames help extend your soil-water season. Irrigate in the evening or early morning to prevent evaporation, and make sure to keep water off of plant leaves.

Beans *green:* Rattlesnake, Romano, Dragon Tongue
dry: any

Corn *sweet:* Anasazi, Tuxana, Top Hat

dry: Hopi Blue, Floriani, Painted Mountain

Greens chard, sylvetta, purslane, Amara, collards

Lettuce Cougar, Ben Shemen, Jericho, Bronze Arrow
Chadwick's Rodan, Arctic King, Grandpa Admire's

Squash *summer:* Dark Star, Cocozelle, Bennings

winter: Lwr Salmon River, Banana, Buttercup

Tomato Pineapple, Aks Traveler, Italian, Myona, Stupice

Try: hot peppers, melons, beets, rutabagas, fall fennel

Winter: favas, cool-weather greens/mustards, sprouting
broccoli, cabbage, Nappa, winter lettuces, kale, garlic

Resources:

Growing Food in a Hotter, Drier Land, by Gary Nabhan; *Rainwater Harvesting* by Brad Lancaster; *Gaia's Garden* by Toby Hemenway; *Desert or Paradise* by Sepp Holtzer; *The Resilient Gardener* by Carol Deppe; *How to Grow More Vegetables* by John Jeavons

ECOLOGY ACTION'S GARDEN COMPANION

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ECOLOGY ACTION EVENTS: 2023

Dear GROW BIOINTENSIVE Family,

Our schedule (subject to change) of public events is as follows.

Onsite Garden Tours at VGFP (May) and TJC (July):
growbiointensive.org/events_main.html

Onsite 9-Saturdays and GardenCorps Programs at VGFP:
victorygardensforpeace.com/garden-corps

The *online* Fall 4-Saturdays Introductory Workshop:
Oct. 28, Nov. 4, 11 & 18, 2023. Register at:
growbiointensive.org/workshop.html

Our full 2023 schedule of events:
growbiointensive.org/events_main.html
or call 707-459-0150

Watch our 2-Week Farmer Training Course at
vimeo.com/ondemand/ecologyaction

Wishing everyone good health and good gardening,
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