

# ECOLOGY ACTION'S GARDEN COMPANION

GROW BIOINTENSIVE News from around the World

## How Three US Mini-Farms Are Sowing Seeds of Global Food Security

By Bob Cooper

Adapted with permission from an article published at Ensia, August 17, 2016

### The Golden Rule Mini-Farm Garden Report

Winter Reflections

By Justin Bartolini,  
Golden Rule Mini-Farm  
Assistant Field Coordinator

The Golden Rule Mini-Farm is an auxiliary GROW BIOINTENSIVE teaching and research garden located near The Jeavons Center in Willits, California. The site has been in production for over thirteen years and also provides housing and training for two to six of Ecology Action's interns as well as apprentices and staff.

Fall has given birth to winter, and the Golden Rule Mini-Farm has grown quiet. Winter compost crops are in suspended animation longing for early spring. We have moved into the time of reflection, organization and preparation; *reflection gives rise to organization which facilitates preparation.*

Our daily connection to the soil, paired with the previous growing season's observations, sinks in, and we grow as living libraries. This reflection stimulates the evolution of why

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*Tiny Biointensive operations show smallholder farmers from around the world how they can grow far more food than conventional approaches.*

Photo Credits: Cynthia Raiser Jeavons/Ecology Action

Her face shaded by a wide-brimmed straw hat, Olawumi Benedict is cheerfully tending to her "little babies"—kale seedlings growing in shallow wooden flats until they're hardy enough for transplanting into soil beds. Three miles over the hills on another small farm, Jonnes Mlegwah is double-digging the soil with a spading fork, preparing to plant potatoes. Both are Africans, but these mini-farms are 140 miles north of San Francisco in Mendocino County, better known for the harvesting of redwood trees and marijuana plants than kale and potatoes.

Benedict and Mlegwah are a long way from home, and the Biointensive farming system they're mastering is a long way from becoming the norm, in the US or Africa.

Still, millions of small-scale farmers, especially in Latin America and Africa, are turning to it because it's low-cost and low-tech, and it produces far greater yields than conventional agriculture while using far less land and water.

Biointensive's key components besides transplanting and double-digging are on-site composting, close plant spacing, use of seeds from plants that have been natu-

rally pollinated and specific food-to-compost crop ratios. These techniques are rarely practiced on large farms, where mechanization is more profitable, but they can be life-changing for the 90% of the world's farmers who work 4 acres (1.6 hectares) or less by helping them to make the most of a given plot of land.

Research shows that Biointensive farms have the potential to use 50 to 75% less land, 50 to 100% less fertilizer, 67 to 88% less water and 94 to 99% less energy to produce a given amount of food than conventional farming does. Perhaps most intriguingly, the Biointensive method "grows" farmable soil—at a rate 60 times faster than occurs in nature—while current farming methods tend to deplete farmable soil through wind and water erosion.

Much of the credit for Biointensive's global impact goes to Ecology Action, which has brought Benedict, Mlegwah and about 100 other interns and apprentices to California mini-farms for internships since 2001. Founded by organic gardening pioneer John

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## Garden Report

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we do what we do and how to approach organization for the next season. Now is the time to finetune curriculum, make crop choices, and all the miscellany that makes up a garden.

As seasons go by, seedling flats fall into decay; basic carpentry skills are one of the many talents a well-balanced gardener must cultivate. Flats are repaired many times and are recycled back into functionality. When the wood from a flat no longer serves a role in the support of seed germination, it becomes kindling for the cob oven or, if made from woods other than redwood or cedar, can be laid to rest in the compost pile.

The fall harvest has provided plenty of threshing and winnowing to prevent any downtime during the winter. It is comforting to have more food in store than the grocery store; abundance and security come from participating as stewards and co-creators with the garden. In this quiet season we also catch up on weighing dry biomass samples and

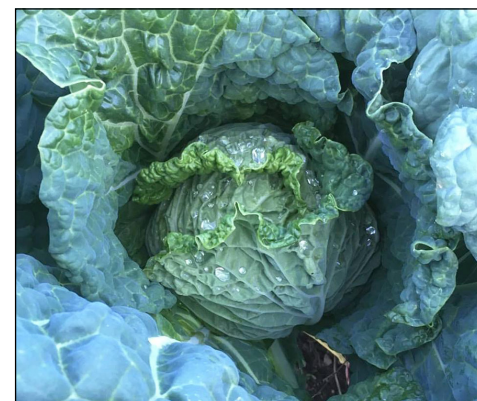
completing worksheets that track yields of food, carbon and timing. These worksheets transform our data into a reflection of the soil we are growing and express patterns for us to discover as time passes and our relationship with the garden evolves.

“During the dreary hungry gap when all else fails—which stretches from late winter through to the ides of spring—the stalwart leek is there to relieve you from a diet of salted this and frozen that,” states John Seymour in *The New Self-Sufficient Gardener*. The leek is one of our super-stars here at the Golden Rule Mini-Farm and Ecology Action in general. The leek produces the most calories per unit of area! This year we have left a majority of our leeks in the ground to overwinter. This may not be the most optimal because they could also be dug up and heeled into soil in a basement or barn, if the barn doesn't become extremely cold! Winter compost crops may be a better use of the space, but it comes down to whether you can get compost crops planted before the seasons change.

In addition to leeks, we also have a healthy supply of kale, cabbage, and

Brussels sprouts still growing in our garden. By keeping our garden as space-conscious as possible we are exercising compassion for all beings. As we learn to use less area for ourselves we open up the potential to set aside more land for wildlife and to work towards creating wildlife corridors connecting noncontiguous habitats.

We hope this Garden Report has been helpful and has given you an idea of the tasks winter brings to the Mini-Farm. For a deeper understanding of what we do here at Ecology Action, we would love to see you at our next 3-Day Workshop this coming March.



*Cabbage overwintering to become a delicious meal!*

Photo Credit: Justin Bartolini

## Seeds of Global Food Security *Continued from page 1*



*The Jeavons Center Mini-Farm, established in Mendocino County, California, in 1982, serves as a global demonstration site for Biointensive farming.*

Jeavons in 1971 and funded by foundations and donations, the nonprofit teaches Biointensive farming at three Mendocino County locations to agriculture activists and researchers from around the world who learn the

method and then go on to teach others.

Sitting at a pine-shaded picnic table overlooking the 10,000-sq-ft Ecology Action farm where Mlegwah works, the neatly bearded Jeavons, 74, sounds professorial while rattling off numbers. But there's no hiding his passion for earth-friendly farming or his concern for the world's growing water scarcity and rapid disappearance of farmable land. “The main criticism of Biointensive is that it requires too much labor,” he says. “But it's really more skill-based than labor-based—you work smarter, not harder. When you miniaturize agriculture, you don't need as much land.”

Support for the method has come from many quarters, including the Peace Corps, UNICEF and the 2010 UN

Convention to Combat Desertification. Former US Department of Agriculture Secretary Bob Bergland has called Biointensive farming a potential way out for malnourished people worldwide. “That would be a remarkable development in this world, and would do more to solve the problems of poverty, misery and hunger than anything else we've done,” Bergland says in Jeavons' book *How to Grow More Vegetables*.

Each year, Ecology Action staff members choose up to eight individuals from outside the US to participate in the internship program based on the food security needs of the interns' native countries and the interns' potential

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## Seeds of Global Food Security

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impact once they return home. Most have been from Latin America in past years, but Biointensive has taken hold well enough there that 2016 interns are mostly from Africa. Interns attend one day of lectures and spend four nine-hour days per week learning on the farms. They stay from first planting in March to last harvest in November. As they master Biointensive techniques, each intern conducts experiments on a separate 300-sq-ft (28-sq-meter) plot—slightly larger than a bowling alley lane—with the research findings then used to advance Biointensive farming knowledge. Benedict beams with pride as she describes her experiment: comparing the seed and biomass yields of millet when it's spaced in a hexagonal pattern at intervals of 5, 7, 9 and 12 inches (13, 18, 23 and 30 centimeters). Upon returning home to Ghana she aims to open a Biointensive farming center with her husband. Ecology Action staff are helping her pursue funding.

"The need is great because climate change has affected the rain pattern," she says. "But farmers can get through famines by preparing the soil deeper so it can retain more water." She is referring to double-digging—the aeration, or loosening, of soil down to 24 inches (61 centimeters) rather than the 6 inches (15 centimeters) or so customary on most farms—which makes roots longer, stronger and healthier; quadruples nutrient availability to plants; and permits closer plant spacing.

**TO READ THIS entire article, please visit <http://ensia.com/features/how-three-u-s-mini-farms-are-sowing-the-seeds-of-global-food-security/>.**



*Bob Cooper is a San Francisco-based freelance writer with recent stories in National Geographic Traveler and Hemispheres. He covers travel, outdoor sports, and many other topics, but the stories he most enjoys writing are profiles of people who are making a positive difference in the world.*

## From the Director's Corner

By John Jeavons



*The Jeavons Center Mini-Farm atop Pine Mountain, Willits, CA*

Photo Credit: Jes Pearce

2016 was a growing year for Ecology Action. I want to share a few of the highlights with all of you.

EA has international partner organizations in Mexico, Ecuador, Kenya, Senegal, Sri Lanka and Russia, and we act as a catalyst, fiscal sponsor and technical adviser for numerous programs and projects in these and other countries. Most notably, as a result of these relationships, we estimate that over two million farmers in Kenya have been trained in Biointensive, and over three million individuals are using these practices in Mexico and Latin America as well.

There are major biologically intensive initiatives throughout Latin America. Over 150,000 people are trained, directly and indirectly, in GB annually. One of the reasons—in Mexico 70% of the people are spending virtually all their income on food and still don't have enough to eat. 50% of the 100 million people in Mexico are only getting one-third of the daily calories they need.

Development specialists in Ghana and Nigeria have asked Olawumi Benedict, one of EA's 2016 8-month interns, to develop a plan to train people in biologically intensive practices coun-

trywide. These countries have many people who do not have food to eat three days out of the week.

EA's newly developed 8-Month Internship program trained seven leaders from Kenya, Canada, Togo, Ghana/Nigeria and Wisconsin, US.

Our team hosted the 27th annual 5-Day Teachers Workshop. In addition we hosted our largest 3-Day Workshop ever, training participants from seven different countries. To date, we have taught approximately 2,097 participants from 47 states and 34 countries in our 3-Day Workshops.

The 9th edition of *How to Grow More Vegetables* (HTGMV) is scheduled to be released in July 2017. Steve Moore is working on a complementary book to HTGMV with a working title of *Biointensive Agriculture: A Pathway to Sustainability*.

EA's Common Ground Garden in Palo Alto, CA, hosted 15 field trips, teaching over 150 children and teens using their recently published sixth grade curriculum.

We are directing beginners in the GROW BIOINTENSIVE method to our 8-part skills video series: [growbiointensive.org/Self\\_Teaching.html](http://growbiointensive.org/Self_Teaching.html) and EA's

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## Rice Experiment Update

By Jes Pearce, The Jeavons Center Mini-Farm Manager



Jean observes rice growth.  
Photo Credit: Jes Pearce

This year we planted rice in the garden, despite the fact that Willits is considered a non-optimal climate for rice growing! The type was an upland variety called Duborskian that comes from Russia. We chose this variety with the expectation that its genetics would help it grow well in cooler weather. The seed is available through Bountiful Gardens.

We soaked the rice seed in warm water for 72 hours. Then we seeded it in 6-inch-deep flats on 1-inch centers on April 17. We kept it in our seedling greenhouse until May 13, at which point

the rice was approximately 6 inches tall. We transplanted the seedlings into the bed on 10-inch centers and covered them with mini-greenhouses. The rice growth seemed slow at first, and my current hypothesis is that this was due to it being an unseasonably cold May in Willits. That being said, it did eventually begin to grow, reaching an average height of about 3 feet tall, with an average of five tillers. The plant's general appearance was thin and wispy with very small seed heads. We harvested the rice on October 16th, meaning it was in the bed for five months after about a month in the flat. It appears it takes an overall six-month commitment to grow rice. In the end the rice yielded 16.6 lb per 100 sq ft of biomass at the harvest weight and 7.1 lb per 100 sq ft of air-dry biomass. The seed yield was 0.8 lb per 100 sq ft. This is 1,362 calories per 100 sq ft of rice at this yield.

Because of the initial slow growth we did a second experiment with a smaller planting of rice. We seeded the flat on June 12 and transplanted into a mini-greenhouse on July 1. This rice was shorter overall than the earlier planting, but had an equivalent tiller and seed production. However, most of the rice in this later planting did not fully mature before the cold weather arrived in Willits.

With these yields, rice is not meeting the minimum requirements to be considered a Carbon/Calorie Crop in the GROW BIOINTENSIVE system. However, I know that the plant has the potential! We plan to trial it again next year.

Based on our experiment, next year I plan to soak the seed in warm water for 72 hours, or until I see it germinate. I will then seed 6-inch-deep flats on half-inch centers on April 25. I will repeat this process flatting on May 2, May 9, and May 16. I want to experiment more with how long it can stay in the flat and push the limit, but I am expecting all the flats will stay in the big greenhouse for a minimum of 20 days. I do not want to transplant into the ground before the soil temperature has reached a minimum of 60°F. No rice will be transplanted after the first week of June, as I do not think that gives the rice sufficient time to mature before the cold arrives in this climate. All of the rice will be covered with mini-greenhouses. While I received most of my experience about growing rice through our expert rice grower, intern Jean Apedoh, I also referenced the book, *The Resilient Farm and Homestead* by Ben Falk, where he shares his experience growing paddy rice in cooler weather. This could be a helpful resource for those interested in growing rice as well!

### From the Director's Corner

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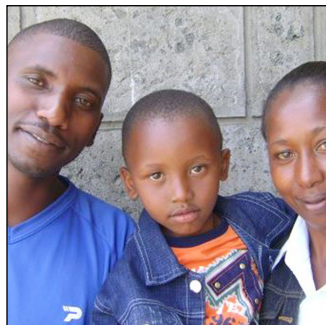
Grow Hope video at [growbiointensive.org/index.html](http://growbiointensive.org/index.html) which shows how people can make a difference at any age.

Within two years we plan to have the 8-Month Internship content online. Every other week a different Farmer/Teacher/Trainer staff person will be available to teach from their area of expertise. We may be cutting back on the number of interns who actually come to our mini-farms, but this will enable us to reach many more new "interns" around the world via an online Internship.





## Interns Express Gratitude to John Jeavons



Thank you for all you have done for us and for the world. I learned a lot during this precious internship, and I'll make sure the sacrifice and resources invested in me to be in this amazing program will be put to good use to help the starving in my community.

I feel honored to have been a part of the internship program. Your humility and compassion have really inspired me. I wish you God's blessings as you work for a better world and a more just food system.

Sammy, Kenya



I arrived home yesterday after three long days of travel. I wanted to write and thank you for all the love, care

and support provided throughout my stay. I keep your vision of a world free from hunger in mind. I hope to share the information I gained with others, to be an example that it is possible to grow all one's food. I have started complaining about the taste of our food because it comes from depleted soil, grown with chemicals. Thank you for sharing the joy of living a healthy life with us.

Bye for now, Olawumi, Nigeria

## Becoming Unified: A Spiritual Journey of Double-Digging

By Joe Huber, Green Belt Mini-Farm Apprentice



Joe Huber becomes unified with double-digging at the Green Belt Mini-Farm.  
Photo Credit: Matt Drewno

Double-digging to me has been a spiritual voyage through a kinetic experience with the help of a spade, a garden bed and a realization from Aikido.

My first exposure to double-digging was during the 3-Day Workshop in November 2015. During John Jeavons' double-digging class, he mentioned a phrase that has always stuck with me and I resonate well with — *“Find a way to unify with life energy (which is the definition of Aikido) to help make double-digging less labor-intensive, and more skill-intensive.”*

While meditating on the definition of Aikido and with plenty of ‘trial and error’ to make double-digging more skill-intensive, I was lucky enough to stumble upon a comparison of move-

ment of energy in double-digging to the movement of energy in walking.

To boil it down, the essence I saw in double-digging is to convert the energy inherent in me into the spade in the most efficient way to double-dig the garden bed. This is the same pattern I saw with walking: to convert the energy inherent in me — from my left foot to my right foot — in the most efficient way to gain distance. That's Aikido to me: *Becoming unified with the surrounding energies — to output energy efficiently.*

The “becoming unified with the surrounding energies” allows a labor-intensive task to become a skill-intensive task, and this transition was my spiritual journey. Once I became unified it was as if the bed dug itself.

*“Opportunity is missed by most people because it is dressed in overalls and looks like work.”*

— Thomas A. Edison



## California Seed-Sharing Bill Signed into Law

By Cat Johnson, reprinted with permission

[www.shareable.net/blog/california-seed-sharing-bill-signed-into-law](http://www.shareable.net/blog/california-seed-sharing-bill-signed-into-law), September 14, 2016



Photo Credit: EA Staff

Seed sharing in California took a major step forward when Governor Jerry Brown signed into law the California Seed Exchange Democracy Act, an amendment to the California Seed Law. It's the latest victory in a global movement to support and protect seed sharing and saving.

AB1810, which was introduced by Assembly member Marc Levine, exempts non-commercial seed-sharing activities from industrial labeling, testing, and permitting requirements. This means that local seed libraries and seed-sharing activities aren't held to the same cost-prohibitive testing required of big, commercial seed enterprises. The law allows seed sharing and saving to continue on a local level, which supports food security, urban agriculture, climate resilience, healthy eating, and a stronger local seed system.

Seed sharing gained mainstream attention in 2014 when agriculture officials in Pennsylvania cracked down on the Joseph T. Simpson public library's seed library. The event served as a catalyst for the seed-sharing

movement. Last year, *Shareable*—an online magazine—partnered with the Sustainable Economies Law Center (SELC), Richmond Grows, Seed Matters, Seed Savers Exchange and several other organizations in the Save Seed Sharing campaign designed to:

- Educate stakeholders about how seed laws apply to seed sharing through seed libraries
- Build public awareness and grassroots support for seed libraries
- Empower local stakeholders to engage in policy advocacy to support seed sharing
- Remove legal barriers to seed sharing through seed libraries
- Support seed libraries that face regulation under seed laws

Since that time, bills that exempt non-commercial seed sharing from commercial seed laws were signed into law in Minnesota, Illinois and Nebraska. The Association of American Seed Control Officials created a working group to develop a compromise

recommendation, and now California has a new seed-sharing law.

Leading advocacy efforts for AB1810 was a class of 4th grade (now 5th grade) students at Olive Elementary School in Novato, CA, that “testified to the importance of seed saving and sharing and biodiversity at the Assembly and Senate Agriculture Committees,” reports SELC, who partnered with a number of organizations, including California Climate & Agriculture Network, California Guild, Center for Food Safety, Community Alliance with Family Farmers, Occidental Arts & Ecology Center, Pesticide Action Network—North America, Richmond Grows Seed Lending Library, Seed Library of Los Angeles, Slow Food California, California FarmLink, Transition Palo Alto, the Ecology Center, and more to advocate for the bill.

As Neil Thapar, Food and Farm Attorney at SELC, noted, “The success of this legislation is due in large part to the collaborative efforts of all the individual and organizational advocates coming together. We share a common belief that a resilient food system starts with a resilient seed system based on locally adapted varieties that represent genetic diversity and a longstanding cultural heritage and tradition of seed saving and sharing.”

Cat Johnson  
([www.shareable.net/users/cat-johnson](http://www.shareable.net/users/cat-johnson))  
is a writer and content strategist covering co-working, the commons and community.



Publications include Yes! Magazine, Utne Reader, GOOD, Shareable, Triple Pundit, Launchable, and Lifehacker.



## How to Grow Seedlings Indoors

By Bountiful Gardens Staff



*Start your seedlings indoors as early as March in some regions.*

Photo Credit: BG Staff

Tomatoes, peppers, eggplant, and onions need to be started at least two months before you want to put them outside.

Melons, cucumbers, squashes, basil, okra, and sunflowers (as well as chia and quinoa in some places) can be started approximately a month before planting out. Germinate seeds at 65 to 75°F. Tomatoes, peppers, melons, eggplant, and basil will germinate best with additional heat, such as the special plant heat mats you can get at a garden store. The top of a refrigerator, gas stove with a pilot light, or any electric appliance that is on for a long period will often add just enough warmth. You don't need anything above room temperature once the leaves appear. Use a good-quality soil mix or make one from good garden soil and compost in roughly equal parts. The price of potting soil is usually a good indicator of quality. Soil should be moist but not wet.

A good habit is to sow only part of your seed at first, saving the rest to plant a week or two later. That way, if the seeds come to harm in some way, you still have some. And when harvest time comes, you won't have all your produce at once, but can pick over a

long period. This is referred to in books and catalogs as succession-sowing.

Garden crops need much brighter light than most houseplants. A sunny window will work, if all the seedlings can get light—you may have to turn the flat often. If the window “almost works” but the light is not quite enough, consider hanging a light just over the plants. A compact florescent (larger size) in an inexpensive drop-light could be just the boost they need.

Many gardeners will need to use mostly artificial light. A florescent shop light or grow light fixture is not very expensive, uses little power, and works well as long as it is close to the plants—light loses strength quickly with distance. Hang your light on an adjustable chain or cord so that it can start 4–6” from the soil, and raise it as the plants grow (or start by putting the plants on blocks and lower them). Plants that are tall and thin, with lots of stem between leaves, need more light. If a plant gets bleached leaves, the light is too close.

Growth should be continuous—if it slows, feed the seedlings with compost tea or other mild liquid fertilizer. Check to see that the roots have not filled the flat or pot. Once the seedlings

are as tall as the pot is deep and have several pairs of leaves, they should be pricked out to a larger container or transplanted into the garden.

If seedlings appear withered at soil level and fall over, they've been attacked by fungi and will not recover. This is called damping off. Here's how to prevent it:

- Use a loose soil mix that drains well and doesn't compact.
- Use Mycogrow or other mycorrhizal inoculant to prevent disease (the good fungi fight the bad fungi).
- Maintain good air circulation.
- Plant larger seeds in a hexagonal pattern so they are not crowded—use chicken wire as a guide for spacing. Smaller seeds can be broadcasted, but not too thickly.
- Keep temperature around 65°F.
- **IMPORTANT**—Avoid overwatering!

For about a week before transplanting to the garden the seedlings need to be hardened off. Set them outside an hour or two at mid-day at first, gradually lengthening into the cooler morning and evening hours. Make sure they don't dry out and protect them from wind and critters. Or put them in a cold frame and open the lid longer each day.

For an easy way to harden off seedlings and get a jump on the season, you can also use glass or plastic jugs with the bottom cut out placed over the plant. These are called cloches. You can also make little plastic tents over the plants.

Much greater protection from frost and cold is attained by using water to store the day's heat and warm the plant at night. You can use plastic bottles of water to surround your seedlings, or put bigger containers of water inside your cold frame, hoop house, row cover, or other enclosure. It's quite amazing how much more growth plants can make with water around them to store the day's heat and radiate it at night.

## How to Build and Use Seedling Flats: Sustainable Seed-Starting Boxes

By Leslie Roberts, in collaboration with Matt Drewno

At Ecology Action, many seed varieties are started in seedling flats and then transplanted into the bed once they are established. There are several advantages to using wooden seedling flats:

- More efficient use of water and space
- Better soil temperature maintained than with plastic containers
- Durable and with proper care will last for many seasons
- Biodegradable

### How to Build a Seedling Flat

These pictures demonstrate assembling a precut kit from Bountiful Gardens, but once you make one from a kit, it's relatively easy to make your own using new or recycled lumber. Redwood or cedar is best, when available. The flats will be constantly getting wet and in contact with moist soil. Redwood and cedar resist rot.



Some of the pieces you'll find in the kit.

### Tools and Materials List

One seedling flat kit:

- 2 short end pieces
- 2 long side pieces
- Several bottom pieces
- Nails
- Hammer (not included in kit)

### Construction

For ease of construction, collect all the necessary tools and materials in one place. This project should take less than an hour. Depending on the age of your children, consider including them. It's a great way to introduce them to simple carpentry and garden preparations.



Start by aligning the bottom pieces with one of the end pieces to determine their placement.

Attach the two outer bottom pieces to the end pieces. Be sure to line up the pre-drilled holes with the board underneath. If they don't align perfectly,



gently tap the nail into place before driving it home. Be careful not to hammer your fingers or thumb!

Add the middle bottom pieces last, positioning them evenly to provide drainage slits on either side.

Add the long side pieces, and you're done!



Carpenter Bobby Z, 1-year apprentice at Green Belt Mini-Farm.

Photo Credits: Matt Drewno

### Recommended inner dimensions for making your own flats:

Standard: 23" x 14" x 3", Half: 11.5" x 14" x 3", Deep 11.5" x 14" x 6".

*"Everybody can be great because anybody can serve.  
You don't have to have a college degree to serve . . .  
you only need a heart full of grace. A soul generated by love."*

—Martin Luther King Jr.



## Redwood Flat Seed Kit

Available at [bountifulgardens.org](http://bountifulgardens.org)

Each kit includes complete instructions, nails, and wood and is made by a small local mill from recycled redwood. Flat material has been reclaimed from old barns, decks and even an old school bus stop shed—nothing compares to this old, well-weathered wood. Redwood flats stand up to constant contact with wet earth and last a long time with reasonable care. They are easily put together, with pre-drilled holes to prevent the wood from splitting.

Each kit makes one flat. Choose from three sizes. A standard flat will weigh about 40 lb when full of moist soil. A half flat will weigh about 20 lb and is preferred by many of the garden staff. The deep flat will weigh about 40 lb and is useful for tomatoes, peppers, etc., that can grow fairly large for transplanting. The standard 3"-deep flat is featured in the picture below.



*Make your own seedling flat from a kit.*

Photo Credit: BG Staff

*Redwood flats stand up to constant contact with wet earth and last a long time with reasonable care.*

## Clarrington Forge D-Handled Fork and Spade

Available at [bountifulgardens.org](http://bountifulgardens.org)



*D-handled forks and spades*

Photo Credit: BG Staff

Clarrington Forge products are manufactured using a unique specification steel which results in exceptionally strong tool heads with the flexibility to absorb all the shock and pressure of hard work, without distorting or breaking.

A joy to work with, this is the fork

and spade used for bed preparation in our research gardens, and is one of John Jeavons' preferred tools. The 11" x 7" head is solid-forged from a single piece of steel and has a one-piece hardwood shaft that is split to form a wishbone handle. The spade has a tread plate. Available in 39" and 43" lengths.



## Update from Latin America

By Juan Manuel Martinez, Director of ECOPOL

2016 was a good year regarding our search for partners with the capacity to use, teach and spread the Biointensive method in Latin America.

**AMIGOS De La Tierra España:** [www.foeeurope.org/spain](http://www.foeeurope.org/spain). This NGO works with several countries in the world. Guillermo Barreiro is the person in charge of its affiliate in Nicaragua. He's now a certified teacher for the Biointensive method and helps to teach others about GROW BIOINTENSIVE. He recently—together with me and other teachers—taught workshops in El Salvador and Honduras. He negotiated and received \$4,000 USD equivalent to print copies of HTGMV once the Spanish translation is ready. He is also working with John Wyss, an American, to get better prices on the printing of 10,000 copies for the Universidad Nacional Agraria (Agricultural National University). We prepared a project that will be approved in July 2017, to work in conjunction with Cataluña, Spain, and other countries.

**SWISSAID:** [www.swissaid.ch/en/home](http://www.swissaid.ch/en/home). Last August I was invited by the agroecology movement in Ecuador to give lectures in Imbabura, Ibarra, Guayaquil, Riobamba, Quevedo and Portoviejo. I also taught workshops in four of those cities. Some technicians asked Fernando, director of the organization, to be trained, and I was invited to return in October. We also traveled through Latacunga, Guangaje, Cotopaxi and San Lorenzo, and a workshop was taught in each. The certified teachers of Vibrant Villages coordinated with Eduar Pinzon who helped me with the practical side of the workshops.

**ECHO:** [www.nih.gov/echo](http://www.nih.gov/echo). Due to a suggestion made by Michael Richardson, I was invited by Environmental Influences on Child Health Concerns, a project of the US National Institutes of Health, to be the main speaker last

October. I gave a conference about climate change in Nicaragua during this year's international meeting. I always take advantage of these opportunities to introduce the GROW BIOINTENSIVE method and make new friends and partners. Ricardo and Haya Romero, along with Marisol and Agustín, also participated. I negotiated with the person in charge of the Haitian venue—the country where the next congress will be held—to participate and teach three workshops for different audiences: university students, NGOs and farmers. A conference will be held before the congress, another during and one when the congress is over.

During 2016 we created four GROW BIOINTENSIVE centers, in Mexico, Nicaragua, Ecuador and Peru, for the diffusion of GB in Latin America. There are certified teachers working really hard in each of these centers. We expect to create a new center in Chile for the Southern Cone next year. It is hoped that this center will reach out to Argentina, Uruguay, and Paraguay as well as Chile.

## Comunidad Biointensiva: A Growing Friendship

By Patricia Mayagoitia, 2001 EA Intern assisting ECOPOL



Seed sharing in Ecuador

Photo Credit: Eduar Pinzon

The GROW BIOINTENSIVE (GB) community has grown significantly in Latin America and the Caribbean since it

began in the 1980s, involving a diverse range of organizations and individuals from most of the countries of the region.

In an effort to develop solid communication among them, Ecología y Población A.C. (ECOPOL) created the online forum Comunidad Biointensiva, <http://biointensivistas.ning.com/>. Here people interested in teaching and promoting the Biointensive method share their experiences, information and questions.

The website was started in 2010 and currently has 1,368 members from 97 countries. To be part of this online community a person creates an account. The site is displayed in Spanish, but some members can answer questions in English as well.

The site enables users to build their own profile, present their work and interests, create a list of friends, receive private messages from other members,

*Continued on page 11*



## Wall to Wall: A Natural Building Workshop Series

By Matt Anderson, Videographer of EA's 2-Week Farmers Course



*Friends and volunteers plaster the south wall.*

Photo Credit: Matt Anderson

In 2012, my wife Renata and I packed our belongings into our car and set out from Los Angeles to find a different way of life. This quest became a multi-year odyssey of exploration to find communities involved in more gentle and sustainable practices. Along the way we met and lived with many new friends who gave us the inspiration and courage that we too could leave behind the 'treadmill' and start living differently.

For a couple of years we continued to travel, looking near and far for the perfect place to settle. Between voyages we stayed as guests with our gracious hosts, the Jeavons family in Willits, California. It wasn't until a longtime local resident, RJ Jergensen, stood up at a community meeting, that it all

clicked. He said: "Make the place you are the place you want to be." It was then and there that we knew we had found our place. What we hadn't realized was that it was our effort that would make it the perfect fit.

We were inspired by our friends in the Natural Building community to build our own house. The main problem was that we weren't builders. We decided to reach out to our friend Michael G. Smith and ask if he might guide us through the process. He recommended using a series of workshops to get the bulk of the building done. With that as inspiration we set out to hold a workshop series called 'Wall to Wall: A Natural Building Workshop Series' at the historic Ridgewood Ranch.

In May and June 2016, dozens of students came out to learn, practice and help us build what would be our home, in an old blackberry patch. For the next month or so we hoisted poles and beams, laid an earth bag foundation, stomped out batch after batch of cob, raised a couple of straw bale walls, tamped light straw clay into wall cavities and plastered it all. By the end of the series we had built most of our small home and made many new friends. It was a joy to actualize something many people dream about and to really put our ethics into practice.

As I look around the house now (having just moved in!), I am surrounded by local natural materials put together by the hands of many wonderful people. The clay we used was from the site. The crushed sand came from a quarry we can see from the house. The timber is almost entirely from discarded logs that came down in a forest fire a few years back. And the trusses that hold up our roof and the siding that keeps us dry are from a hundred-year-old chicken coop recently taken down on the ranch.

In the context of living in a community that strives to feed itself, we are so proud that our contribution can be a humble example of how you can house yourself using natural and local materials. And let me tell you, to sleep in a house you helped to build brings some of the best (and most needed) rest I've ever had . . .

### **Comunidad Biointensiva** *Continued from page 10*

upload photos and videos, participate in groups and discussions, share job opportunities and announce upcoming events and workshops. This allows users to relate to others with similar goals, challenges, and climate and to build friendships. As a result, inspiring and successful stories of organizations and farmers who work to achieve sustainable agriculture, seed diversity and food sovereignty are shared.

The site also contains a section of scientific articles, GB materials and a broad selection of publications related

to sustainable agriculture and seed and food production. To ensure the site functions properly, ECOPOL assigned a group of knowledgeable people to monitor content and respond to comments and questions promptly.

Comunidad Biointensiva invites you to visit the site and read its bimonthly newsletter presenting stories of successful Biointensive farmers around Latin America and the Caribbean. You'll also find a selection of local recipes, additional information regarding GB and more. Or you can follow

related publications on Facebook at [www.facebook.com/SoyBiointensivista-1625298911057780/](http://www.facebook.com/SoyBiointensivista-1625298911057780/).

This website has allowed a relatively small group of people with a strong interest in learning and practicing GB to become a family. The number of certified GB teachers has increased through the sharing and interaction available at Comunidad Biointensiva. For more information please contact Juan Manuel Martinez, [ecopolac@aol.com](mailto:ecopolac@aol.com); Marisol Tenorio, [biointensivo.marisol@gmail.com](mailto:biointensivo.marisol@gmail.com); or Susana Hernández, [arcazana@gmail.com](mailto:arcazana@gmail.com).

## Herbal Spotlight

By Rachel Laase, The Jeavons Center Assistant Mini-Farm Manager and Student Herbalist

### *The Health Benefits of Rosemary*



Image Credit: <https://mygrandmasgarden.net/2014/06/27/rosemary>

*Rosmarinus officinalis*, more commonly known as rosemary, is a beloved herb that is often found in abundance in any herbalist's cabinet. Rosemary, which means "dew of the sea", is a perennial shrub native to the Mediterranean region. It is an herb that has a long history going as far back as Ancient Egypt and has many medicinal qualities.

Rosemary is most commonly known to add a delicious flavor to cooking, but its uses go beyond just culinary. It is a digestive tonic and can help with anxiety, support liver health, bring down a fever, keep colds at bay, ease skin ailments such as eczema and dandruff, as well as boost memory and fight fatigue. So many incredible benefits!

Besides putting it in your winter stews or infusing it into cooking oil or

vinegar, an easy way to incorporate rosemary into your daily routine is by making a hot tea. When it is steeped in hot water, the beneficial oils are released, making its medicine fully available.

For external use, rosemary is great to incorporate in homemade bug repellent spray and also as an herbal hair rinse. Rosemary is a very effective natural preservative, so working it into recipes can help those mixtures be less perishable.

Here at Ecology Action we're lucky our rosemary produces year-round, allowing us to have a bountiful harvest and a fully stocked herbalist's cabinet at all times. If you would like to experiment with one of the benefits of this herb, please try the following recipe.

*... a digestive tonic  
that can help with  
anxiety,  
support liver health,  
bring down a fever,  
keep colds at bay,  
ease skin ailments,  
boost memory and  
fight fatigue.*

### Homemade Bug Repellent Spray

#### Ingredients

3–4 c apple cider vinegar  
2 Tbsp each of dried sage, rosemary, lavender, and mint  
1 quart-sized glass jar with an airtight lid

#### Directions

Fill the glass jar with apple cider vinegar and the dried herbs. Seal tightly and shake well each day for 2–3 weeks. Once ready, strain out the herbs and add water 1 to 1. Store this mixture in a spray bottle until ready to use. The infusion can be refrigerated, but it will keep without it.

*For external use, rosemary is great to incorporate in  
homemade bug repellent spray and also as an herbal hair rinse.*

*Rosemary is a very effective natural preservative,  
so working it into recipes can help those mixtures be less perishable.*





## Biointensive Team Corner

### Introducing Justin Bartolini

Golden Rule Mini-Farm Assistant Field Coordinator-Apprentice



I was raised in the forests and mountains of the Pacific Northwest by parents who double-dug their own garden beds, and a school system that encouraged an early connection with the environment by stressing agriculture, horticulture and forestry. I attended Alderleaf Wilderness College where I studied ethnobotany and nature-based teaching and leadership. I also earned my Permaculture Design Certification. It was this period of study that brought me full circle back to the double-dug beds of my parents and the concept of true agricultural sustainability. It was a bibliography citation that led me to the GROW BIOINTENSIVE method and the work of Ecology Action. I look forward to applying my passions for teaching and stewardship of the environment that nurtures us, while working towards the sustainability of the soil that feeds us.



*Justin checks the growth of sorghum.*

Photo Credit: Golden Rule Mini-Farm Staff

## Turmeric Rice

Adapted from [allnigerianrecipes.com/rice/turmeric-rice.html](http://allnigerianrecipes.com/rice/turmeric-rice.html)

To coincide with the rice experiment that took place at The Jeavons Center Mini-Farm this year, we include a traditional Nigerian rice dish.

### Ingredients

- 1 c long grain brown rice
- 2 tsp turmeric powder
- 1 tsp curry powder
- 1 tsp black pepper
- 1 small red onion, chopped fine
- 2–3 c chicken stock
- 1/4 c fresh red bell pepper, chopped
- 1/2 c green peas
- Salt to taste

### Directions

In a 4-quart saucepan, combine the chicken stock, turmeric powder, curry powder and black pepper. Bring to a boil. Add the rice and salt. Cover and cook on low.



*A traditional jide dish in Nigeria*

Photo Credit: allnigerianrecipes.com

After 35–40 minutes, test for doneness. Rice should hold its shape, but mash easily between your fingers. If it's still firm, add a bit more stock. Add the red pepper, onions and green peas to the top of the rice. Cover and continue cooking. The rice is done when all the stock has been absorbed and rice mashes easily. Stir to combine the vegetables and rice.

## EA Events

❖ April–November  
8-month  
GROW BIOINTENSIVE<sup>SM</sup>  
Internship

❖ March 3–5  
3-Day Ecology Action,  
GROW BIOINTENSIVE<sup>SM</sup>  
Sustainable Mini-Farming  
Workshop, Willits, CA

❖ April 15  
5-Day GROW BIOINTENSIVE<sup>SM</sup>  
Basic-Level Teacher  
Certification Workshop  
application deadline\*  
(see prerequisites below)

❖ June 10  
Ecology Action  
Mini-Farm Tour,  
Willits, CA

❖ June 15  
Apprentice and Intern  
applications due for the  
2018 internship season

\*Prerequisites for  
5-Day Teachers Workshop include  
completion of an introductory  
3-Day Workshop and an active  
practice of GROW BIOINTENSIVE  
techniques. For a complete list of  
workshop prerequisites and  
information on the GB Teacher  
Certification Program, visit  
[growbiointensive.org/  
about/trainings.html](http://growbiointensive.org/about/trainings.html).

Select the  
“Teacher Certification” tab,  
and download Booklet #30.  
The prerequisites are on  
pages 4 and 30.  
Application deadline is  
April 15th.

## Book Reviews

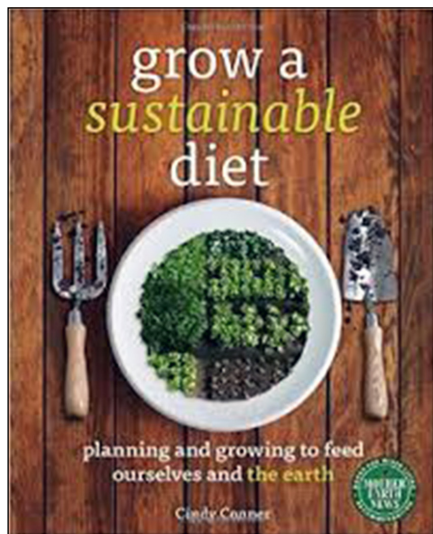


Image Credit: [www.newsociety.com/](http://www.newsociety.com/)

### *Grow a Sustainable Diet: Planning and Growing to Feed Ourselves and the Earth*

by Cindy Conner  
(New Society, 2014)

Review by New Society.

Everyone loves to prepare a meal with ingredients fresh from their own garden. But for most of us, no matter how plentiful our harvest, homegrown produce comprises only a fraction of what we eat. And while many gardening guides will tell you everything you ever wanted to know about individual crops, few tackle the more involved task of helping you maximize the percentage of your diet you grow yourself.

*Grow a Sustainable Diet* will help you develop a comprehensive, customized garden plan to produce the maximum number of calories and nutrients from any available space. Avoid arriving in August buried under a mountain of kale or zucchini (and not much else) by making thoughtful choices at the planning stage, focusing on dietary staples and key nutrients. Learn how to calculate:

- Which food and cover crops are best for your specific requirements
- How many seeds and plants of each variety you should sow
- What and when to plant, harvest, and replant for maximum yield

With a focus on the Biointensive gardening method and permaculture principles, getting food to the table with minimum fossil fuel input, and growing crops that sustain you and your soil, this complete guide is a must-read for anyone working towards food self-sufficiency for themselves or their family.

*Cindy Conner is a GB certified Intermediate-Level Teacher. She researches how to sustainably grow a complete diet in a small space at her home near Ashland, VA, and has produced the videos Develop a Sustainable Vegetable Garden Plan and Cover Crops and Compost Crops IN Your Garden.*

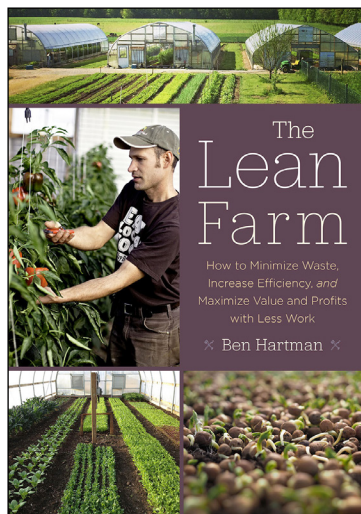


Image Credit: Chelsea Green Publishing

### *The Lean Farm: How to Minimize Waste, Increase Efficiency, and Maximize Value and Profits with Less Work*

by Ben Hartman  
(Chelsea Green, 2015)

Review by Leslie Roberts.

Available at [bountifulgardens.org/products/BGE-1234](http://bountifulgardens.org/products/BGE-1234)

*... cultivate plants on centers, rather than in rows. This allows for more plants in a smaller area, minimizes water use, and minimizes weeding time.*

Sometimes farmers approach farming with a free-form mindset. They know they need to get certain things done at certain times, but beyond that, the flow of tasks is often unexplored or unexamined when it comes to making the most of their time, talent, and materials.

In *The Lean Farm*, the author explains concepts and methods to trim time and operating costs. The process is called 'leaning'. Each aspect of farming operations is explored, including unnecessary effort in the field, which is called waste, caused by wait time and excessive operating expense in the form of too much staff or management. By leaning practices and increasing flow, production is increased and ultimately income as well. Many of the concepts have been successfully

used in business and commerce, and the examples in the book show they work just as well for farming.

One example of a leaning process is to cultivate plants on centers, rather than in rows. This allows for more plants in a smaller area, minimizes water use, and minimizes weeding time. In the end, the harvest is greater with less effort and fewer resources needed.

The writing is clear and easy to read with lots of detail and examples to help walk you through the concepts from beginning to end. If you've ever wondered how you might produce more without additional investments of money or acquiring more land, consider applying the methods in this book to minimize waste and maximize value.



## ECOLOGY ACTION'S GARDEN COMPANION

~ Published three times a year ~

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## Support Ecology Action's Work

Since 1972, EA has been researching and demonstrating the growing edge of sustainable food raising and making this knowledge available to people everywhere. It is your support dollars that enable this growth of knowledge and global outreach.

In addition to your project-specific support, please consider increasing your general support so that we may continue to expand the availability of this fundamental knowledge to people everywhere—and grow a healthier, fairer, more hopeful tomorrow for us all.

## Ecology Action's Garden Calendar: A Working Gardener's Guide

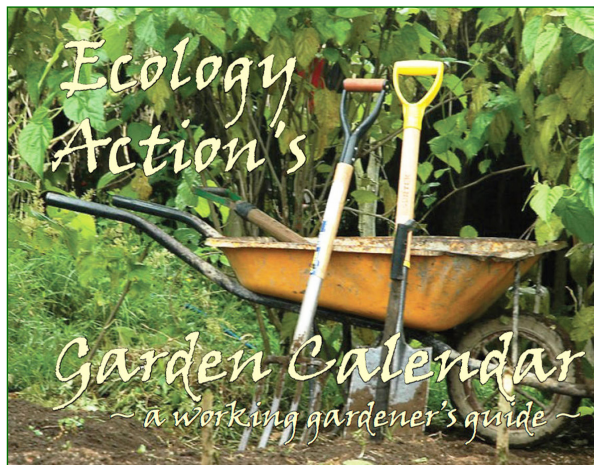


Photo Credit: EA Staff

EA has created a Garden Calendar with recommendations and checklists to use each month. Here are some thoughts and ideas on how to use this calendar.

The more you garden, the more you'll find that it's fun, exciting, and a good practice to plan 3 to 6 months ahead. This sort of foresight can make your life easier, your harvests more successful, and your plants happier.

Planning and record-keeping are important tools for a successful garden from year to year, and things you

write down now could help make a better harvest next year. Use the calendar to make notes which you can refer to as needed next season.

As you learn about new varieties and gardening practices, write them on the calendar so they can be explored a little at a time, giving you a chance to learn and understand what you're just beginning to delve into.

This calendar is available as a PDF at <http://growbiointensive.org/PDF/EcologyActionBiointensiveGardenchecklist.pdf>.

YES, I would like to support Ecology Action's global outreach. Annual membership begins at the \$40 contribution level and includes Ecology Action's triannual Newsletter.

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Ecology Action Newsletters are available online at [growbiointensive.org/Newsletter/Archive.html](http://growbiointensive.org/Newsletter/Archive.html).



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