Ecology Action
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GROW BIOINTENSIVE^{SM} Apprentice Opportunities

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Enclosed: Personal Data Form; Release Form

Suggested reading:
Cultivating Our Garden from Context Institute, www.context.org/iclib/ic42/jeavons/.
How Three US Mini-Farms are Sowing the Seeds of Global Food Security from Ensia
https://ensia.com/features/how-three-u-s-mini-farms-are-sowing-the-seeds-of-global-food-security/.

INTRODUCTION

Thank you for your inquiry about apprenticeships with Ecology Action in Willits, California.

Our main work here is a process of studying, learning and researching from the mini-farm/garden so we will be able to help those in need of improved GROW BIOINTENSIVE techniques and approaches for the growing of food and soil. Because of this primary emphasis, we need to train individuals who are willing to commit to thorough learning and understanding this work and to devoting their time to sharing this way of life in their lives.

In order to provide an introduction to our work, we offer half-day tours (including mini-classes in GROW BIOINTENSIVE techniques) at our Willits site. We also offer periodic Three-Day Workshops. For those interested in the Teacher Certification Program and who have attended a Three-Day Workshop, there is the Five-Day Teacher Workshop. Information on tours, workshops, and classes, as well as current developments within Ecology Action, is available on our website, www.growbiointensive.org.

We also have The Garden Companion; Ecology Action's newsletter, which is published three times a year. The e-version is free to those who have attended one of our workshops. The printed version is free to those who become Supporting Members of Ecology Action with annual dues of forty dollars ($40.00). Monetary support in the form of memberships and other donations is a vital aspect of the budget, and our work would not be possible without it.

A central tenet of the guiding philosophy of Ecology Action could be summed up in the well-known phrase of Dr. E. F. Schumacher, the Economist, "Small is beautiful." Just as increased size has brought numerous problems to society and agriculture, so to, it often brings problems to organizations. To avoid the negative aspects of large organization, Ecology Action remains small by choice. Our work, however, has had a significant effect in the world. Since 1972, many of the basic practices of organic gardening and farming have changed, often because of our influence. Many generally accepted agricultural and social ideas, such as what constitutes a viable farm and how best to foster soil health and healthy communities among the malnourished people of the world, are also now beginning to change—again, at least partially because of our biologically intensive work. We have been a source of inspiration and practical knowledge for countless projects, mini-farms, gardens, individuals, books, magazines, and newspapers throughout the world.

The "small is beautiful" approach to this work has several important ramifications. One is that our Willits site is only open to the public on tour days and for workshops and other regularly scheduled events. The staff found that opening their garden and home to the public in an ongoing, open-ended way was distracting to the work being done, as well as to the personal and family lives of the staff. People wishing to visit the garden are asked to come on scheduled tour days.

Ecology Action receives hundreds of letters each year expressing interest in its apprenticeship program. Clearly there is a need for more training centers with broad, in-depth GROW BIOINTENSIVE programs. We have found that we cannot fill this need for everyone and still do the demonstration, tending, and research and development work upon which the training and education are based. There are several other opportunities for training in GROW BIOINTENSIVE, Biointensive and other organic food-raising techniques. Some of these organizations, scattered throughout the country, are better equipped to handle larger numbers of apprentices or to accommodate people who may wish to train for only a short period of

time. A partial list of these can be found at the end of this booklet.

This booklet describes the program and explains the kind of person Ecology Action is looking for. It can also be used as a tool to help you determine your personal path. After reading this booklet, you may decide our apprenticeship program is not exactly what you want. Because of this and the fact that we have only two to three openings periodically available, we have listed other places and resources that may be useful to you. □□□

What Is Ecology Action?

Ecology Action is a non-profit tax-exempt organization based in Willits and the town of Mendocino, California. It conducts demonstration research and apprenticeship and intern training in the GROW BIOINTENSIVE method, publishes information on the method, and distributes this information globally.

In September of 1972, Ecology Action founded the Common Ground research and community garden in Palo Alto and began the formal apprentice program in the garden in September of 1972. In 1982, Ecology Action moved its headquarters to The Jeavons Center (TJC) in Willits, California and began mini-farming on 10,000 square feet of a one-acre mountain side, developing soil that, at the time was less than optimal. It was rated poor for grazing.

Since 1972, the low resource inputs and high crop yields of the GROW BIOINTENSIVE method have been studied in the research Mini-Farm under the direction of John Jeavons. In summarizing his experience and results with the method, John has come up with provocative new practical ideas for the abatement of world hunger, for family food sufficiency, and for urban and rural small-scale farming. He continues to work to create the most productive and sustainable food and soil-growing system possible. His goal is to give more people the capability of raising their own food and of nurturing the earth for posterity.

From the yields recorded in the Common Ground and TJC research gardens, John determined that, depending on their skill and soil, a family of four may be able to grow all of their own *soft fruits and vegetables* in four to eight 100-square-foot raised beds in a six-month growing season. Over this period of time, one member of the family would need to spend an average of as little as 20 to 40 minutes a day caring for the garden.

The smallest amounts of land needed to raise *complete diets* are also being researched. This miniaturization of complete-nutrition food production has determined that a complete, balanced diet may be grown in one-tenth, or less, the area required by conventional farming methods. The United Nations has called for the production of increased calorie and food value per unit of area with an organic, small-scale approach as an answer to world food needs. Sustainable closed-loop GROW BIOINTENSIVE mini-farming practices are one key solution to this need.

The **goal** of Ecology Action's GROW BIOINTENSIVE closed-loop sustainable Mini-Farming, Education and Research Center is to develop an equitable and environmentally sound soil-building and food-raising *system* that is manual and depends predominantly upon locally available resource inputs. As this system is "grown", *patterns* appear which

make it possible to more easily learn the *universal scientific principles* involved. The research is based primarily on observation and experience over many years, more than on statistical modeling. The key to optimal results is often the consideration of multiple variables. The variables in the system are changed slowly.

The GROW BIOINTENSIVE method being developed is a *sophisticated, low-technology* food security safety net for people in virtually all climates and soils where food is grown successfully in 152 countries to date. In the process, a potential for the improvement and maintenance of global sustainable soil fertility has evolved. GROW BIOINTENSIVE practices have been and are being rediscovered, developed and documented using biologically intensive systems which date back 4,000 years in China, 2,000 years in Greece and 1,000 years in Guatemala.

Individuals, communities, projects and programs in 152 countries are already benefiting from this work in applications around the world. People have set up successful farms for nutrition and/or economic intervention after reading Ecology Action publications and/or taking a GROW BIOINTENSIVE introductory 3-Day Workshop. A few have set up successful economic mini-farms. Ecology Action is encouraging these and other initiatives to use GROW BIOINTENSIVE practices to "grow soil", develop and maintain sustainable soil fertility and grow complete diets in a small area.

The Jeavons Center provides the latest research information, education and technical assistance through correspondence and classes, workshops and courses within the United States and globally. In this way, it is a service center where staff, apprentices and interns learn as they provide assistance to others.

Growing healthy soil takes time. On the average, 3,000 years are required for nature to produce the six inches of farmable soil needed to grow crops successfully. In California this process takes about 12,000 years. According to a Soil Science Master's thesis at the University of California–Berkeley, GROW BIOINTENSIVE may have the potential to "grow" up to six inches of soil in as little as 51 years.

Ecology Action's most important current focus is *sustainable soil fertility.* The issue of full sustainability in agriculture has emerged as a topic of general concern. Definitions of the approaches vary; however, most promote "more sustainable practices" which are less *immediately* destructive to the natural environment. Few are more than ten percent sustainable in terms of overall soil quality, which is the only true measure of *long-term sustainability*. Ecology Action's research objective is 100% economic, environmental and soil sustainability. This work is challenging because the research is producing an expanding body of knowledge and understanding, rather than an immediately visible "product."

The Potential of GROW BIOINTENSIVE

Ecology Action believes that eventually most people in the world where food is grown will be able to grow a complete vegan diet for one person annually on as little as 4,000-sq-ft, and sometimes less, using GROW BIOINTENSIVE practices and a better understanding of how to choose the crops which will produce the most calories and compost materials with the diet crops in the smallest area.

Four thousand years ago the Chinese were using a biologically intensive, "miniaturized" form of agriculture. The Chinese grew food with this approach and maintained soil fertility for thousands of years without significantly depleting the soil. As recently as 1890, this way of farming enabled them to grow all the food for one person on about 5,800 to 7,200-sq-ft, including animal products used at that time, and, adjusted, 2,800 sq-ft for one person's diet.

Despite all its challenges, the people in Biosphere 2, an experimental environment in Arizona in the 1980s, using techniques based in part on those rediscovered by Ecology Action, were able to raise about 83% of their diet during a two-year period within a "closed system" on approximately 2,957-sq-ft per person. This experience demonstrated that an annual diet for one person could be raised on the equivalent of 3,562-sq-ft. In contrast, conventional agriculture in the United States requires approximately 101,000-sq-ft, depending on the diet involved, to produce an *average* diet—while bringing in inputs from other areas and soils in order to even make this possible.

Approximately 9,000-sq-ft are used in developing countries for the same purpose given actual agricultural practices being used and actual diets being eaten.

Currently, the staff is also performing research to demonstrate that a family may be able to raise all, or the major share of their income in farming, on 3,500-sq-ft or less during eight months of a year with the GROW BIOINTENSIVE method.

One of the most important aspects of Ecology Action's work is developing a unit of approximately 40 beds where a person's food and compost materials can be grown—as little as half of an acre including paths for four people, about one tenth of the area normally required by conventional agriculture. This is a significant micro-scaling of agriculture. Information proving the feasibility of such a project has been provided since 1972 by Ecology Action's research and is still being developed.

The potential for the GROW BIOINTENSIVE method reaches far outside California. Ecology Action has corresponded with people from all over the world who want to raise food using the method. Ecology Action's manual on the method has been translated into French, Spanish, German, Turkish, Hindi, Russian, Portuguese and Kiswahili. We plan to publish additional translations as funding is made available. Over the past few years, the number of people using the method in Latin America, Europe, Africa, New Zealand, Sri Lanka, India and Russia has steadily increased due in large part, to Ecology Action's outreach efforts. More people skilled in the method are needed in these countries.

The Mini-Farm and its apprenticeship program are financed by sales of Ecology Action publications, supporting memberships, plus grants and donations.

Ecology Action in Perspective

Ecology Action is known internationally for its research and development of small-scale food production techniques utilizing GROW BIOINTENSIVE food-raising practices.

The GROW BIOINTENSIVE method has the capacity to produce yields two to six times those reported by commercial US farmers, while using 12% to 33% of the water, 0 to 50% the purchased nutrients (in the form of organic fertilizer) and 1 to 6% the energy per pound of food produced.

Today Ecology Action provides a unique "GROW BIOINTENSIVE Farm Skill Preserve," one of the few places in the world where the philosophy and techniques which validate small-scale farming still exist. One man who has taught Biointensive mini-farming practices in Corsica, France, said that he had to come to Willits to learn the techniques formerly used on the island of Corsica, so they could be returned to his country. An official from the Chinese Agronomy Society, in Beijing, wrote that he learned a significant amount from Ecology Action. Also, China has recently developed an interest in resource efficiency, not just high yields.

Although university programs in GROW BIOINTENSIVE are beginning and major projects are taking shape both nationally and worldwide, none are yet as interdisciplinary as Ecology Action's program in Willits and the town of Mendocino, where the purpose is to

provide the broadest perspective and the most in-depth focus for other programs and projects.

Achieving "closed-loop" sustainable soil fertility requires working with the natural system. It is a gradual process that involves not only learning techniques, but also understanding the interrelationships in nature and working in harmony with its yearly cycles. For most of us, that requires slowing down so that our hands, hearts, and heads can fully observe, feel and understand the whole of the environmental fabric as well as each of its threads.

It took Ecology Action seven years of patient observation and persistence to 'break the code' for optimal wheat production. We can now teach that skill in a short class, so that others can benefit from our mistakes, failures and successes. We sometimes experience crop failures, and/or other challenges as we search for the best solutions. It is not that the solutions are complex or sophisticated; often, they are very simple and can be learned quickly—once they are discovered and understand.

Becoming a GROW BIOINTENSIVE apprentice involves slowing down to allow learning to happen gradually. Perception and understanding take time. Farming is more than a series of techniques; it is a way of life. Understanding a whole range of practical solutions enables us to best raise crops while enhancing the environment.

Understanding GROW BIOINTENSIVE

After 50 years of gardening, Alan Chadwick said he was still learning. GROW BIOINTENSIVE sustainable mini-farming concepts, techniques and practices are continually evolving and "growing". It has been said that it takes 50 to 200 years to fully test a new farming system. For example, in 1999 after 27 years, the perspective of growing 60% compost/grain crops, 30% special root crops and 10% vegetable crops was fully developed conceptually, and now in 2018, we are implementing this more fully. We are only part of the way into the process of testing, developing and actualizing the full potential of GROW BIOINTENSIVE practices in a difficult farming soil and water situation.

Alan Chadwick prepared the soil differently for each crop. Ecology Action has simplified this process while maintaining good yields and nutritional quality. The soil is prepared and fertilized the same for each crop, so once you know how to "grow" carrots, you also know how to grow such crops as potatoes, tomatoes, wheat, cotton and bamboo. Generally, the only element that changes is the spacing. Overall what is being tested is the GROW BIOINTENSIVE *system*-so what is learned from growing radishes may provide a key to the growing of sorghum and fruit trees and vice versa.

The Jeavons Center Mini-Farm Site

In April of 1982, Ecology Action moved its research and demonstration mini-farm garden to a rural site three hours north of San Francisco. The food-raising area is part of 20 acres on a hilltop overlooking the Willits Valley. The land is owned by John Jeavons and Cynthia Raiser Jeavons, with part of the land and facilities made available to Ecology Action for $1.00 a year.

The site is steep with a bit of a hike down to and up from the garden. During the first season, two staff members and some volunteers fenced in an area for the research garden, laid out water lines, and prepared and planted 40 beds. During the second season, 40 more beds were added. Today, there is the equivalent of 110 100-sq-ft growing beds—many of which are used to grow compost crops. Much of the garden will is terraced.

Currently, two adults are living on the site. The buildings include a solar home, a small office and storeroom, the library/classroom building, two two-story yurts, one of which includes a common room and kitchen with pantry, a 200-square-foot cabin, a 20-foot study trailer, a composting toilet, a farm building and two garden buildings for tools, fertilizers and seeds. There is a telephone and electricity in the large yurt, but the buildings do not have central heating/cooling. There's a feeling of camping out, especially in the summer months. Life at the site is simpler and more rustic than in most of the United States. The Jeavons Center Mini-Farm values a non-smoking, low-alcohol, drug-free environment.

The temperature range during the winter is 25° to 75°F, with a daytime mean of 55° and a nighttime mean of 44°. During the summer months the temperatures range from 50° to 105°. The first and last frost dates are October 15th and May 15th for the intermittent "soft" frosts, and November 15th and April 15th for "hard" frosts.

Rainfall, although variable, usually begins about October 15th and lasts until about April 15th, with a range of 35 to 80 inches during this period. It almost never rains from June through September. Some snow can be expected at least once during the winter.

Winds range from 0 to 70 miles per hour on top of the hill, and 0 to 20 miles per hour in the garden areas—with the strong winds in the winter season.

The Victory Gardens for Peace Mini-Farm site

The Victory Gardens for Peace Mini-Farm is located at the Stanford Inn Eco-Resort in the town of Mendocino, California, under an established relationship of mutual vision and respect. We are asked to be respectful of guests and staff at the Inn. Often guests will come through the gardens and ask questions, which is a wonderful opportunity to connect with individuals from around the world who share an interest in biologically intensive food and soil growing.

The town of Mendocino is located within a 10-minute walk. The town is small but has almost everything you will need outside of the Inn. There are county buses that serve Fort Bragg, the next largest town 15 miles to the north, plus Willits, and Ukiah inland. In Fort Bragg there are more options for food and drink, in addition to hospitals, dentists, chiropractors etc.

The Stanford Inn is a vegan eco-resort and Victory Gardens for Peace staff and apprentices are asked to respect the Inn's policy of not serving meat, fish or dairy on site. Apprentices are asked to please refrain from cooking in their rooms. There are some electric appliances in the intern housing area for heating food and drink. However, no open flames are permitted in the housing area. An outdoor kitchen is under development to facilitate larger meals for Mini-Farm staff, apprentices, interns and local potlucks. Dining

is allowed in the Raven's Restaurant- a 100% vegan, gourmet organic restaurant on site which serves food grown from the Mini-Farm

Internet and laundry facilities are available on site and are included in the program without additional charge. Please be respectful of all facilities and keep them clean at all times. Some living situations may have communal areas which will be shared among the various kitchen, garden and other interns at the Inn. These should be kept in good condition and any needed repairs or challenges (leaks, lightbulbs, fuses, etc.) should be reported to the Mini-Farm Manager or maintenance crew at the Inn.

Research Emphasis

Ecology Action's research currently emphasizes the "growing of soil" through annual winter grain compost crops, such as wheat, corn, amaranth and sorghum, which produce both a large amount of compost materials and a significant quantity of calories. This is especially important to a large number of the world's people who live on marginal soils with low organic matter levels and low mineral levels in developing-nation conditions. Tree crops are not an emphasis even though several kinds and varieties are grown on the site. Also, conventional organic farming, Bio-dynamics, Fukuoka Natural Farming and Permaculture are not significantly emphasized in the program.

The experiments on site sometimes deviate from the techniques described in *How to Grow More Vegetables, Fruits, Nuts, Berries, Grains and Other Crops*…, (HTGMV) as ways to improve techniques, soil and food quality are explored.

Research Challenges

The constraints that have kept our research and soil improvement at Willits proceeding at a slow rate, and our yields often lower than the norm in better soils, are similar to those in many developing countries. The yields are good considering the challenges noted below. Higher yields with even greater resource efficiencies are possible in better soil and climatic situations and are often obtained by others using GROW BIOINTENSIVE techniques in such conditions.

Crop failures and other challenges are sometimes experienced as we seek the best solutions. Usually, discovering the answers is part of a screening testing process that evaluates many strategies, amounts and types of compost crops and varieties to discover the best approach for the goal desired. Once discovered, the answers are often simple, based on sophisticated principles, and can be learned easily.

The Research Environment at The Jeavons Center Mini-Farm

Generally, most test beds are 100-sq-ft though some test beds and areas are smaller or larger. The quantities of organic fertilizers applied are generally the amounts prescribed by the Grow Your Soil testing service www.growyoursoil.org/. The Mini-Farm research almost always uses cured compost made from materials grown on the Mini-Farm.

Soil tests are performed mid-September after many main season crops have been harvested. Tests are made from fire distinct areas due for part due to different mini-climates. Several samples from within each specified area are taken, aggregated and sent in for testing.

We also use *Test Your Soil With Plants* 2nd ed. (John Beeby) each year and consistently notice indicators of cool soil, salt-stress, and in some areas, differing degrees of fertility. This important resource helps you look at wild and cultivated plants to determine what is happening in the soil. This resource cultivates the skill of observation and gives real-time indicators of the soil as it changes throughout the year. Soil tests done in a laboratory are expensive and out of for many of the worlds' farmers. However, *Test Your Soil with Plants* 2nd ed. is an easy and reliable

way to deduce what is happening by observing what plants are communicating.
The challenges at The Jeavons Center Mini-Farm have been:

Climate: Both the Alaskan and Hawaiian jet streams pass over the Willits area. This creates dramatic temperature fluctuations for the Mini-Farm. During the growing season, there is often a forty- to fifty-degree daily temperature fluctuation. A nightly air temperature of at least 60°F (15.5°C) appears to be desirable for the microbial life in the soil to flourish. That level is only reached about ten times a year. It is also desirable to have daytime temperatures under 95°F (35°C) because pollination is reduced when the temperature goes any higher. A significant number of over 95°F (35°C) daytime temperatures occur during the most active four- to five-month growing season. This growing season also has an arid period without rain and makes it more difficult for the soil to retain water well. However, significant improvements in the quality of the soil have been made through the use of GROW BIOINTENSIVE practices.

Soil: The loam (almost sandy loam) soil (approximately 49% sand, 36% silt and 15% clay) was rated as only fair for grazing at the point when cultivation began, partially because of its very high magnesium levels of the serpentine soil. These soils generally do not produce high yields, at least initially. The background soil sample exhibited a poor calcium/magnesium/ potassium ratio in addition to being very high in magnesium, contained some sodium and was low in organic matter, calcium, potassium, phosphorus-1 and -2, sulfur, zinc, iron, manganese and boron.

Due to financial constraints and location considerations, this was the land that was chosen. It was less than ideal for ease of soil improvement, yield increases and reduced resource consumption, but a good site for research into gardening and mini-farming under these conditions. For example, the first crop of alfalfa grew only a few inches tall with only two harvests. Now that the soil nutrients are better balanced, alfalfa test yields as high as three times the US average has been obtained.

Water: the wellspring water we use contains an excess of both sodium and magnesium. The water is also cold, which tends to retard microbial life in the soil, and therefore plant growth, when the garden beds are watered with it during the main growing season, which is arid.

Organic Matter: Crops are grown with the goal of producing a large amount of mature compost material per unit of area on a "closed-loop" basis. This is a way of working towards "100%" sustainability. Presently, due to growing tests, that by their very nature do not produce sufficient organic matter to ensure sustainable soil fertility, there can be less compost produced than is optimal for the test area as a whole. This situation often produces lower yields than are eventually to be expected. Current research experiments are bringing a better understanding of how the system can best produce the optimal compost quantities necessary for the best crop growth and sustainable soil fertility.

The Research Environment at the Victory Gardens for Peace Mini-Farm

The Victory Gardens for Peace Mini-Farm is located about 100 yards from the Pacific Ocean in the town of Mendocino, Northern California at 39.32^0N; 123.80^0 W. For those familiar with the Sunset Garden Zone System, we fall in Zone 17, a climate dominated by maritime influences, similar to those found throughout Southern Oregon, Northern and Central California.

The climate in this zone features mild, wet, mostly frostless winters and cool summers with frequent fog or wind. The summer fog lowers evapotranspiration and decreases our need to water as much but also can trap moisture with the potential to

encourage mildews and molds. Some heat-loving plants do not receive enough heat to fruit or flower reliably. Many plants which require heat when flowering and setting seed to finish just can't make it here. Also, cool tolerant varieties are selected whenever possible. That said, leafy vegetables and other cool-season crops thrive throughout the year. It's rare, but possible for our winter low temperatures to reach 36 to 23°F (2 to –5°C). Our summer highs usually fall in the 60 to 75°F (16 to 24°C) range.

Victory Gardens for Peace test the soils every year in October, after the main season crops have gone to maturity. Any beds that have received fertilizer or compost in the previous 3-4 months are not tested. It is best to be consistent with when you perform soil tests because, depending on the weather and time of year your soil, may test differently. The Mini-Farm is divided into three distinct areas where separate testing is done due to obvious differences in soil composition.

Many of the micro and macro nutrients have been steadily increasing as a result of watering from various wells drilled on-site and additions of fertilizers to balance deficiencies. In 2014, a new well was activated which was later found to be extremely high in boron, sodium and iron. This led to a yield decrease of many crops on the Mini-Farm including beans, corn, potatoes and others. In 2015, gypsum was added to help leach the high levels of minerals accumulating in the soils as a result of the well water. The drop in all three is promising and yields are again increasing. Effort to water more efficiently to limit water use and increase in salts has also been implemented.

Research Choices and Testing Dissemination

The amount of time, funding and test bed area available at the two Mini-Farm sites limits the number and types of tests that can be performed. Generally, Ecology Action's goal is not to attempt rigorous university-type statistical development and analysis with its multiple replications. Rather, Ecology Action's goal is to run key tests, the results which may stimulate university and test

Cumulative Soil Tests for 10-Bed Design at Victory Gardens for Peace

	2010	2011	2012	2013	2014	2015	2016
OM	2.9	4.1	5.1	5.5	4.1	5.1	5.4
CEC	14.9	15.8	12.9	14.7	16.0	19.5	13.9
pH	6.6	6.1	7.1	6.3	6.4	6.1	6.4
Ca %	65.8	58.9	68.6	54.1	68.5	60.9	70.6
Mg%	20.4	18.6	19.7	19.2	13.4	14.9	11.9
K%	5.4	5.5	6.7	8.5	3.9	3.6	4.7
Na%	2.3	3.3	5.4	7.4	5.3	6.7	4.5
H%	5.9	13.7	0	10.5	8.9	13.7	8.6
Ca	1960	1650	1770	1590	2193	2375	1962
Mg	365	312	305	339	258	348	199
K	311	303	335	487	246	271	255
Na	80	107	159	250	194	302	144
H	0.9	1.9	0.0	1.5	0.0	2.7	1.2
N	87	112	134	139	82	128	-
P1	34	59	50	48	32	47	33
P2	103	105	93	80	52	-	-
S	14	41	29	45	68	37	55
Zn	5.8	7.7	6.0	5.4	4.0	7.8	3.7
Mn	46	57	59	41	14	44	18
Fe	82	144	108	109	70	259	178
Cu	2.0	3.1	2.7	2.4	1.2	2.8	2.1
B	1.4	2.5	4.7	6.6	6.3	10.1	6.0
Soluble Salts	0.4	0.4	0.5	0.5	0.5	-	-
Sand	64%						
Silt	21.2%						
Clay	14.8%						

station research around the world in all types of climates and soils where food is grown. Its goal is also to develop baseline information about yields, plant spacing/density, fertilizer and compost amounts and cropping patterns to be used to maximize the probability that the practices used by GROW BIOINTENSIVE farmers, mini-farmers and gardeners will be as fully sustainable in terms of soil fertility as possible. In order to accomplish this, multiple-year tests will sometimes be performed in some areas.

Another purpose of this research is to perform long-term soil building tests that most organizations, institutions, programs and people will not perform due to the length of time required. For example, 14 years of soil building were required in the sandy loam soil at TJC before noticeable improved plant health occurred in 1995. In nature this usually takes hundreds of years. At this point there was still not a noticeable increase in compost crop or diet crop yields. An additional 4 years passed, for a total of 18 years, before significant increases in dry biomass and grain calorie yields began to be indicated in 1999. An additional year, or 19 years, passed before these biomass and grain yields spread to a significant number of additional test areas in 2000 when annual grain crops exhibited almost double biomass yields and some increase in caloric production.

ECOLOGY ACTION'S APPRENTICESHIP PROGRAM

The apprentice program of Ecology Action offers people seriously interested in learning a new approach to farming, an opportunity to become proficient in the GROW BIOINTENSIVE method of small-scale farming, to learn from and with the Mini-Farm staff as they learn from the many farming experiments undertaken each year as part of the on-going research. While apprentices learn the skills needed to become a better farmer in the process, the ultimate success of an apprentice is dependent upon that person's own initiative, involvement, drive, focus, follow-through and hard work. The program in itself cannot guarantee a successful farm for a graduated apprentice. The success of a farm is dependent on many variables including soil quality, climate type, water quality, and markets as well as farming knowledge and skills.

The Apprentice Program's main purposes are to better enable a person to learn the most effective farming practices in a given situation and to train teachers and program and project staff. The most successful apprenticeships involve a person taking responsibility for an increasing number of key tasks and following them through to their completion.

At the two sites, where the yield and limits of the method are being tested, we are still determining the factors that make the difference between low and high levels of resource consumption, low and high yields, and sustainable and soil-exhausting forms of food production. Apprentices learn the scientific principles and actual practices being used for the specific GROW BIOINTENSIVE system. Over time, apprentices also become involved in the ongoing development of the mini-farming concept and the functioning of the research garden.

Apprentices come to Ecology Action to learn our GROW BIOINTENSIVE research system. Organic row agriculture, Bio-dynamics, Permaculture and Fukuoka Natural Farming are worthwhile approaches to agriculture, but are not part of Ecology Action's Apprentice program. If you'd like more information on other methods, please see the resource list at the end of this booklet for suggestions.

Even though all levels of research are practiced and taught all the time, the general work that we are doing involves an understanding of advanced concepts. We expect an apprentice to take the responsibility to learn and understand our system before making suggestions to staff about possible proactive improvements within the basic system.

The work is often demanding. All produce must be weighed and recorded, as well as all compost fertilizer inputs. Time, water use, and other factors are also monitored. Strict procedures are adhered to and evolve slowly, so that we know what works and doesn't work and why. We grow vegetables, flowers, herbs, grains, potatoes, high-protein beans, crops for compost, trees, berries, grapes, some novelty crops, and income-producing crops such as lettuce, parsley, and basil.

There is work during the winter as well, such as maintaining paths, growing compost crops, minimizing any possible erosion on garden beds, weeding, planting trees, chopping wood, and other Mini-Farm work, as well as garden planning, reading and textbook research.

The time spent in different kinds of work is approximately 50% in the garden, 25% reading/teaching/planning, and 25% other, although percentages will differ from month to month, and year to year. Research and writing skills are an important asset. Apprentices often write information sheets, booklets and procedures. Independent thinking, creativity, and teamwork are

expected, but there are also well-defined priorities, and each apprentice must be able to follow directions. Work activities are shared by all; there is no separation of work duties among Mini-Farm staff.

The apprenticeship is full-time, so no outside jobs are possible. The understanding and developing of GROW BIOINTENSIVE is expected to be the primary focus of the staff's, intern's and apprentice's workday. The Mini-Farm work is done 7 days a week; it is not a 9-to-5 job. Each week consists of 5 to 5-1/2 workdays and 1-1/2 to 2 days off, depending on the season and the number of people on-site. The gardening and planting routine is a complex, tightly choreographed process each year, and twelve-hour days are the norm, though sometimes from November through March the pace in the garden is more relaxed. Even during the winter period, however, the amount of time in the garden fluctuates with the weather. This can be a time for reading, writing and studying.

Our schedules are arranged based on what is most optimal for the garden and may need to be adjusted, depending on the conditions at the time. Flexibility is important for everyone to keep in mind.

Everybody needs to have a way to tell what time it is, as certain tasks optimally need to be performed at specific times during the day.

Vacations are arranged according to the needs of the gardeners as well as the needs of the garden. Except for special circumstances, vacations are scheduled in August (one week maximum) and November through March (three weeks).

Goals of the Mini-Farming Program

Our goal is the development of food-growing systems that can be understood and used worldwide by people with the fewest resources, as well as by those in developed countries who see the need for a more sustainable, resource-conserving agriculture. We are about *three-quarters of the way* through this process ourselves, and the apprentice program is a way to learn from our many years of experience.

The program consists of a varying schedule of demonstrations, talks, practical work, observation and directed readings. Much of what an apprentice learns will come through doing and individually structured tutorials. The topics covered in reading and/or field work include:

Techniques: History, Philosophy, Bed Preparation, Compost, Seed Propagation, Double-Digging, Companion Planting, Insect Life, Pest and Disease Prevention, Data Collection.

Crops: Vegetables, Grains, Beans, Fodders, Compost Crops, Fruit and Nut Trees, Herbs, Flowers, and Novelty Crops.

Mini-Farming: Basic concepts such as Yields, Land Use, Nutrition, Economics, Resource Use, Fertilizers, Water and Organic Matter, Soil Limitations, Functionality and Modularity.

Applications: Creating Mini-Farm scenarios for the locale where apprentices expect to work. If possible, apprentices should provide the following information for their area:

- Monthly rainfall amounts
- Monthly minimum and maximum average temperatures
- General soil type, texture, and nutritive levels (including pH, N, P, & K), and notable trace mineral levels (a soil test and evaluation by www.growyoursoil.org is recommended)
- Local diets
- Kinds of tools and materials locally available
- Market demands

The present objectives of the Mini-Farming Program include:

- Determining and demonstrating the minimum area of land required to grow a complete, balanced vegan diet on a "closed-system", self-sustaining basis.

- Developing a successful economic Mini-Farm which can be managed by hand and be "closed-system" and self-sustaining in terms of organic matter for compost fertilizer on 10%, or less of the cultivated area growing crops, not including path area.
- Applying the method in rural and urban gardening systems in developing countries.
- Developing and utilizing simple, sophisticated, low-technology applications appropriate for small-scale farming.

Apprentices work on the development of these goals as well as their own areas of specialized interest.

There is a difference between the *accumulation of* ideas and the *development of a system of understanding*. The emphasis of Ecology Action's apprenticeship program lies in enabling the individual to develop a deeper understanding of how the various components of the method work together and to obtain a knowledge that is not only conceptual but *integrated into a discernable lifestyle*. This knowledge evolves gradually through a learning process which involves an initial period of *expansion* as the apprentice is exposed to new ideas and new ways of looking at challenges; a period of *contraction* as he/she synthesizes this knowledge of the understanding.

The Mini-Farm procedures are standardized for ease of communication, understanding, general operation and research. Sometimes there may appear to be an easier way to perform a particular task or prioritize a series of tasks, but that apparently easier way would often be problematic for the Mini-Farm learning and research experience as a whole.

Aspects of the First Year

During the first year, an apprentice will develop a *beginning* level of sensitivity and skill and will have a limited number of opportunities for making decisions. In great part this will be a learning of what to do. The apprentice will be exposed to an entire year of GROW BIOINTENSIVE food-growing experience in the garden. The apprentice will develop three classes on GROW BIOINTENSIVE techniques to be presented first to Ecology Action staff apprentices and interns, then (normally in the second year) at Ecology Action workshops. The apprentice will also develop and present three crop classes, one each on 60%, 30% and 10% crops, to Ecology Action staff, interns and apprentices. Depending on interest, skill and time, the apprentice may also work on a project. Sometimes student projects are chosen to become booklets or books.

During this period, we hope to endow you with the 10% of the information that can be learned easily, which will allow you to obtain 90% of the results. The remaining 10% of the results, which requires 90% of the learning time, is left to you to obtain on your own with gradual improvement in your skill and knowledge over time.

Aspects of the Second Year

The second year of the apprenticeship program enables a person to develop an

intermediate level of GROW BIOINTENSIVE skill and should develop confidence in the practitioner to relate to the constantly changing yearly growing cycle. As crops grow differently in response to an improving soil, improved skills of the farmer, and climatic changes, the learning process really begins. In great part this will be a learning of why things work.

The apprentice develops and presents six classes on three additional techniques and crops. Increased opportunities for decision-making develop, and the apprentice is given more responsibilities. At the end of an apprentice's second year, it is sometimes possible to arrange a visit to a developing country. This can enable the student to broaden his/her perspective and allow for hands-on application of the knowledge gained in the Mini-Farming program.

Aspects of the Third Year

The third year enables an apprentice to develop an advanced level of experience, skill, and sensitivity. At the end of this period, a person should be able to plan, develop, and run a GROW BIOINTENSIVE food-raising project at a new site on a sophisticated low-technology basis, and be able to develop creative solutions to most situations likely to be experienced in the future. To "land on his/her feet" when faced with the unexpected. During this year, much more independent decision-making and responsibility are expected, though the apprentice is still under constant staff supervision. Independent study in areas of the person's interest is expected; this may evolve into a special project or a booklet. In great part this year is a learning of everything more deeply.

Looked at from Ecology Action's perspective, the apprentice's first year involves time and funds spent on the learning process. At the end of the second year, with the apprentice's increased awareness and skill, Ecology Action “breaks even”. By the third year, Ecology Action is able to benefit from the apprentice's accumulated expertise. During the fourth and fifth years of GROW BIOINTENSIVE learning and gardening, teaching skills can be honed. If it is mutually decided an apprentice may be asked to stay on as a staff Farmer/Teacher/Trainer with full participation in the annual Mini-Farm research and planning process occurs in the fourth year. It is obvious that a long-term commitment benefits both Ecology Action and the apprentice.

Staff Apprenticeship

Sometimes staff positions are available for particularly skilled and promising apprentices. If this is the case, employment with Ecology Action and the apprenticeship take place concurrently.

The type of work performed by Mini-Farm staff is like that performed by a Mini-Farm apprentice, except that a staff person normally has more responsibility and, because of his or her increased skill- and experience-levels, does more work. Ecology Action anticipates staff apprentices will stay with the organization for an extended period of time after the apprenticeship is complete—normally for five, and preferably ten, years.

It should be noted that an Apprenticeship is not designed for a person trying to decide what kind of farming to do. Rather it is for people who have decided to make closed-loop sustainable GROW BIOINTENSIVE Mini-Farming a life’s work.

Individuals who are trying to decide whether to make GROW BIOINTENSIVE their avocation should take an Ecology Action Introductory 3-Day Workshop. There are generally two annually, usually on the first Friday through Sunday of March and November. At these workshops, the highlights and main aspects of GROW BIOINTENSIVE that have been learned and developed over almost 50 years are shared, along with an over 200+-page manual which is not otherwise available. The Workshop is similar to a “driver’s training” for growing into the use of the

manual for the rest of your life. Full details may be found at: www.growbiointensive.org/workshop.html.

ECOLOGY ACTION'S EXPECTATIONS

- Apprenticeships are for those who wish to become better equipped to teach teachers in GROW BIOINTENSIVE sustainable ways of life: by living such a life and actively catalyzing this process in others. To fully benefit from the learning process, the student must already know what he/she plans to do with the skills which will be obtained during the apprentice-ship.

- We are not interested in admitting someone to the program so he/she can learn the techniques of the GROW BIOINTENSIVE method. For that, you should read *How to Grow More Vegetables* ... and try it out in your own backyard or community garden.

- This program is not a place to decide what one wants to do with one's life, but a place to become better equip to accomplish what one has already decided to do. Ecology Action seeks individuals who have reached the point in their lives where they want to be of service to humanity and the environment. This service can take the form of daily significant activity with occasional wonderful "aha"-learning high points; it requires pleasurable perseverance, patience, being rooted and grounded.

We are looking for an unusual combination of qualities:

- Highly motivated, but willing to be satisfied with modest monetary compensation
- Having strong convictions, yet flexibility
- Willing to help people help themselves by example, not to do things for people
- Willing to take responsibility for one's own growth and learning, rather than waiting to be taught
- Able to make a long-term commitment

We are a small, often very active group, and we expect equal energy from apprentices. The main rewards are the results of all our work. Thomas Edison once noted that creativity is 1/2% inspiration and 99-1/2% perspiration! We see our work as service that involves, not an escape from the real world, but an escape to a viable solution to some of the challenges that so many people prefer not to face.

For the foreseeable future, the focus of our apprenticeship program will be to provide people to fill long-term, permanent positions on Ecology Action's staff. These staff people are needed to teach GROW BIOINTENSIVE Mini-Farming to more people more efficiently and more effectively. (Some shorter-term applications for a three- to five-year commitment may be considered.) Previous experience is not a requirement for admission to this program. Also, it is expected that some of our graduate apprentices will, over time, be sent overseas to guide key GROW BIOINTENSIVE food- and soil-growing projects around the world.

The month of the program is considered a trial period to enable the participant to better assess the program as well as his/her own level of desire for this kind of work. Periodic reviews are scheduled at the four-month, six-month, one-year, and two-year points.

During the first year of the apprentice-ship, the apprentice generally receives no money from Ecology Action, the apprenticeship experience being defined as the exchange of work for knowledge. See *In Defense of Old-Fashioned Training* elsewhere in this booklet.

Tuition Fees and Expenses

For First and Second Year Apprentices, Ecology Action pays for CIMA Volunteers insurance. The apprentice is responsible for his/her own medical and dental There is a tuition fee for the first year. The

apprentice is expected to make a $2,000 deposit *one month before the scheduled date of arrival* ($1,000 for tuition; $650 toward food; $350 toward utilities and other expenses. Major medical insurance is required to provide for unexpected expenses.

A medical package that pays approximately 80% of expenses is available through various insurance companies for approximately $1,800. A Dental/Vision Expenses Reimbursement of up to $600 for bills paid is provided beginning the second year.

The third year, the apprentice may be paid a stipend for his/her work; to be determined according to the funding available and personal needs. Food, utilities and other expenses are the same and are paid in monthly installments. The following benefits are also included:

- Vacations: Four calendar weeks (160 hours) vacation, including scholarship stipend. This is to be used in a calendar year and cannot be accumulated over time.

- Holidays: The following nine days are paid holidays for staff: New Year's Eve and New Year's day, 2 days, Memorial Day, 1 day, Independence Day, 1 day, Labor Day, 1 day, Thanksgiving, 2 days, and Christmas, 2 days.

- Sick/Family Emergency Leave: Available after the first three months; up to 28 days annually.

- Medical /Health Benefit: $200 per month to be used toward medical insurance and/or other medical expenses.

- Dental/Vision Benefit: $600 annually for reimbursement of paid Dental/Vision expenses. Receipts are needed.

Apprentices are responsible for all of their personal expenses. This amount will differ from person to person, but will probably not need to exceed $2,400 per year, not including medical and dental expenses.

Scholarships are sometimes available for especially good candidates. A scholarship can include $6,000 for tuition, food, utilities, and other expenses; plus $200/month Medical/Health Allowance, and $2,400 toward personal expenses.

Apprenticeship Expenses

	Year 1	Year 2	Year 3
Tuition	1,000	—	—
Food	2,400	2,400	2,400
Utilities, etc.	600	600	600
*Major medical insurance (estimate)	700-1,800	700-1,800	700-1,800
*Dental insurance	600	provided#	provided#
Personal expenses	2,400	2,400	2,400
TOTAL	**$7,600-$8,800**	**$6,100-7,200**	**$6,100-$7,200**

*Provided by Apprentice

A Dental/Vision Expenses Reimbursement of up to $600 for bills paid is provided beginning the second year.

Personal Supplies to Bring

Bedding, etc.:
Sheets, pillow cases and/or sleeping bag,
pillow, mattress pad
Towels, washcloths
Bowl/wash basin, water jug, water glass

Clothing:
Shoes/work boots with good tread
Good pair of waterproof boots with heavy treaded soles
Everything from shorts to warm jackets
Old work clothes
Sunhat
Rainwear

Other:
Personal toiletry items
Battery-powered flashlight
battery-powered shavers and other appliances
Rechargeable batteries
Favorite recipes
Musical instruments, art supplies, etc.

LIFE AT THE MINI-FARM

General Working Schedule of the Mini-Farm

The Mini-Farm directly reflects our understanding of it. It also reflects our relationship with it. It calls on us to cultivate the soil, a strong sense of responsibility, and ourselves.

Varying somewhat with the weather, the time of year (and even with the time of day, especially during the hot summer), and the amount of work to be done, the regular workday often lasts from early in the morning to well into the evening. Giving the Mini-Farm the hours from seven or nine in the morning to six or nine in the evening allows for proper watering and transplanting time and helps to endure that it is well run.

Certain tasks such as watering particular sections of the garden or harvesting produce are arranged among the gardeners on a long-term basis due to the need for continuity. The work to be done on a day-to-day basis is periodically written on a white board, so that we can keep track of the many projects to be completed. Do not hesitate to ask questions about the work to be done or about how long it should take. See to it that you take part in a variety of garden activities from day to day for different learning experiences. Often, working with another person can help you learn a lot more and can make the work more fun.

Ecology Action is deliberately a small organization. Simple housing is provided. There's a solar shower available in the garden in warmer weather and a shower in the large yurt as well. Meals range from vegetarian to vegan with a modest amount of fruit and vegetable oil (no meat or fish is cooked or eaten on the Ecology Action site). Crops from the Mini-Farm are often used and, there is a storage pantry as part of the large yurt's kitchen. Apprentices and interns fix their own breakfasts and lunches and take turns cooking the evening meal, doing dishes, and cleaning up. There are also other tasks to be shared not directly connected to the garden. Laundromat facilities are in town, 25 minutes away, and there is a manual laundry available in the large yurt.

Willits is twenty minutes down the mountain by car and about half-an-hour by bicycle. (Uphill by bicycle takes an hour to an hour-and-a-half, depending on how fit one is.) Transportation back and forth to town is limited if you do not have a vehicle, but usually someone goes to town every day or two. Accommodation for emergencies will, of course, be made. There is a wide range of churches in town. There are also good Greyhound bus connections from town to the

San Francisco Bay Area and other parts of the country.

The First Few Days on the Mini-Farm

After you are settled into your place to live and are ready to begin working on the Mini-Farm, there are a few things that you need toto know in order to get going. The gardeners already at the site will make sure that you know:

1) Where the tools are kept and how they are cared for;
2) the watering arrangements;
3) the location and identity of crops, herbs, flowers, vines, trees and weeds in the garden;
4) garden tours and workshops.

Before you begin any task, make sure that you are confident about how to do it. Hopefully, as time goes on, you will discover why you are doing things in certain ways. When unsure, just ask someone.

Personal Learning Responsibilities

We all have different motives for being part of the Mini-Farm, but the common ground which we share is being here to learn. While the Mini-Farm and staff help provide basic direction, you must provide the motivation and realize the meaning of your learning. And just as one learns to speak and read by listening and observing, one learns the language of the Mini-Farm by doing the same. It does take time, and really, the learning never stops. But to learn, we must give the Mini-Farm time to teach us what we need to know—and remember it never stops teaching us something new if we are willing to listen and observe.

The weeks and months pass quickly. You can better fulfill your personal learning responsibilities by:

1) Realizing that this apprenticeship is only the beginning of your education and experience in this area of interest, and that you have a whole lifetime ahead to learn and experience more—no matter how old you are (or think you are). Our first Three-Year Apprentice was 59 years of age and went to share his knowledge and skill in the Philippines;

2) trying to focus your interests as much as possible, especially in regards to how you plan to utilize what you learn here, in the future. It is better to learn a few things well than to learn several things superficially. That way you can have a foundation on which to learn other things, and hopefully, a network of other people to help you learn more;

3) keeping in mind some sort of timetable for performing readings and personal projects. There is some assigned reading, but most experience and study outside of the Mini-Farm routine is up to you. There is an extensive library representing most facets of agriculture, homesteading, alternative energy, and so on, at The Jeavons Center site, which has been very helpful to all of those who have spent time as apprentices.

You will generally find that as you become better able to define what you want from the Mini-Farm, your sense of accomplishment and satisfaction with your learning will increase. The sooner you are able to make those definitions (allowing for changes in perspective, of course), the more you will learn.

The following comprise some suggestions to help your learning along:

1) Keep a written journal, diary, or notebook of your experiences, thoughts, feelings and questions. Writing is an excellent way to work out thoughts and "relearn" what you have learned. It is also a good way to note your learning progress when reviewed later. Even a summary of a few sentence at the end of each month will be instructive and useful.

2) Take written notes when you read, otherwise much important information may be missed or forgotten. Discussions of reading materials are much more productive when you have notes to refer to.

3) After the first month or so, list a few learning goals for yourself (anything from how to identify nutritional deficiencies to how to grow hardwood cuttings—and everything in between). Following each goal, figure out what would be the best way to fulfill that learning goal, whether it would be through personal instruction from a staff person or researching information on your own.

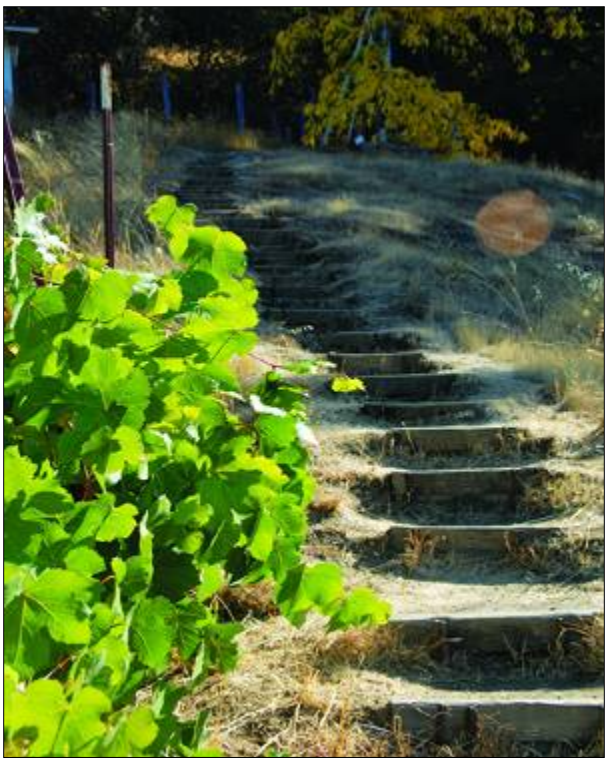
4) Keep a list of plant personalities for each crop. This accumulating knowledge base will make organization and planning of 52-week growing schedules easier and more effective—and will mean you don't have to "remember" what to do each week.

These are only a few suggestions to assist learning. There are many others that might work better for you. Most of the learning takes the form of experiencing and working on the Mini-Farm, in addition to instruction, discussion, reading, and a few field trips. Any suggestions for ways to improve the learning process are helpful and much appreciated.

Day-to-Day Learning

Many learning opportunities occur every day on the Mini-Farm, ranging from profound questions, to identification of new insects and plants, to development of an attitude of acceptance and understanding for some of the more repetitive, yet important tasks in the garden. Ask questions as they arise, or write them down for later, if necessary (it is helpful to carry a pen and a small notebook), but do not put them aside and forget them. When you have questions, ask someone who would know the answer or look it up in one of the books in the Mini-Farm library. (The combined total of books, pamphlets, and papers at the Willits site amounts to over 5,000 pieces.) The Jeavons Center is here to learn from, and things are never so busy that you can't take a few minutes to get an answer to a question. Get to know the local people too. They are full of experience and knowledge about all kinds of things, including gardening.

Over time, as you gain observation skills and increased feeling for the plants and soil, you will find yourself asking better questions which require more complete or "whole" answers. These questions can serve as a partial gauge of your learning progress. Holistic questions ask a certain level of care, patience, and observation from you. They will lead you to learn how to discover your own answers therein: *"The garden makes the gardener."* Your questions and insights will greatly assist the staff and other apprentices and contribute to the greater body of knowledge and understanding of the world we all share as well.



Garden Projects

Consider taking on a garden project or projects. The focus, interest, and energy a project provides and develops within you can make the learning easier and better. If you are interested, discuss and exchange these ideas with others in the garden. Projects can be

almost anything from crop research to designing and building garden structures and tools. A few ideas for projects are:

1) Save some of the seed from garden crops;
2) plan and teach a mini-class;
3) explore the possibility of marketing cut flowers locally;
4) help maintain the garden library.

Garden Meetings

Mini-Farm meetings are held each week, formally or informally. Discussions revolve around garden topics and related subjects. The meeting is a chance to ask in-depth questions and to share experiences concerning the garden.

Reading

Reading is important for gaining information and to help stimulate your own opinions, ideas, and creativity. One morning each week is available during your working hours for this study (except during April, May, June, September and October), and you are strongly encouraged to spend additional time each week as energy, necessity and motivation allow.

A Typical Year

September — Plant autumn compost crops, weatherize paths, collect seeds

October — Order potatoes, garlic and trees if needed, cut wood, repair miniature-greenhouses and drainage ditches

November — **Hard frost** and rain periods begin.
Build autumn compost piles, begin mini-greenhouse growing period

December — Annual planning, order seeds, weeding

January — Plant trees, berries, grapes, roses

February — Prune trees, grapes, roses; plant grains

March — Begin spring food-raising, raise spring seedlings

April — Hard frost and rain periods end
Food-raising work accelerates, build spring compost piles

May — Warmer-weather growing begins

June — Hot-weather growing begins

July — Begin major harvesting period

August — Prune tree collards and berries; begin major re-preparing of harvested growing beds.

Teaching Opportunities

***Mendocino College Classes*—**Classes on GROW BIOINTENSIVE topics may sometimes be given at Mendocino College, Willits, California, by Mini-Farm staff, GROW BIOINTENSIVE certified teachers, Ecology Action GROW BIOINTENSIVE apprentices and possibly others who have taken a GROW BIOINTENSIVE SM Three-Day Workshop and have prepared specially to give a particular class.

***Mendocino College Course*—**Classes at Mendocino College, Willits, California, that are part of a GROW BIOINTENSIVE accredited 3-unit course are sometimes given by Mendocino College-approved Ecology Action Mini-Farm staff. Sometimes GROW BIOINTENSIVE certified teachers and/or second- and third-year apprentices may be guest lecturers.

***Three-Day, Five-Day and Nine-Day Course Classes*—**Classes at Ecology Action's Willits, California (and other locations), Workshops on GROW BIOINTENSIVE topics are given by Ecology Action Mini-Farm staff, GROW BIOINTENSIVE certified teachers, and second- and third-year apprentices who have prepared specially to give a particular class.

THE APPLICATION PROCESS

The **first** step in applying for an apprenticeship is to read the following Ecology Action publications:

◊ *The Sustainable Vegetable Garden*, 1999
◊ *How to Grow More Vegetables*... 9th ed., 2017
◊ *The Backyard Homestead, Mini-Farm and Garden Log Book*
◊ *Biointensive Mini-Farming: A Rational Use of Natural Resources* (Booklet #0)
◊ *A Perspective* (Booklet #9)
◊ *The Complete 21-Bed Biointensive Mini-Farm* (Booklet #14)
◊ *Biointensive Micro-Farming: A Seventeen Year Perspective* (Booklet #19)
◊ *Micro-farming as a Key to the Revitalization of the World's Agriculture and Environment* (Booklet #21)

The enclosed articles are also required reading:

◊ "Cultivating Our Garden", *In Context* magazine
◊ The Call to Dig", J. Tevere MacFadyen, reprinted from *Horticulture* magazine
◊ "Feeding the World", *The Christian Science Monitor*

The following are recommended but not required:

◊ *One Circle*
◊ Booklets #12, #15, #17, #25, #26 and #36

The **second** step is to attend one of our **scheduled tours or workshops.** See our calendar of events at growbiointensive.org/events_main.html

If you think you are ready to make a *commitment* after reading these materials and this booklet, the **third** step is to submit your application. Please write us with your thoughts on the key questions that follow. You need to convince us that the time spent will be worthwhile for both you and us. Include the enclosed Personal Data Form and Release Form with your application and $50 for processing.

The most desirable starting point for the apprentice would be the first half of September, although exceptions are sometimes made. Please explain your particular circumstances if you wish to propose another starting date.

It is best to apply six to twelve months in advance. The processing period often takes at least two to six months and can involve an exchange of correspondence and/or phone interviews. Those completing this stage may be asked to travel to the site for a four-day to one-week work-visit.

Key Questions

- Do you have any previous farming or horticultural experience? If so, please describe.
- Tell us what you think of physical work, alternative technology, world hunger, and the idea of freedom as self-chosen obligations to oneself and the world.
- How do you see the future, and how are you preparing for it?
- How are you on follow-through?
- What successes are you most proud of? What lack of success have you experienced?
- What challenges have given you the most difficulty?
- Briefly describe some of the things you hope to learn during your apprenticeship
- Based on what you know about the GROW BIOINTENSIVE method at this time, describe how you hope to apply the method in the future.
- What do you expect to be doing in fifteen years? No matter how small- or large-scale your ideas, we are still interested.
- Are you attached to creature comforts?

Which ones?

- What do you do if you are bored?
- Are you a talker or a doer? In what way?
- What are your needs?

Please tell us about your background—and also your present physical condition. There is always plenty of work to be done on the Mini-Farm, and going up and down to the garden a few times a day takes some getting used to! Please list any conditions, previous injuries or operations that might make certain tasks difficult for you.

Financial Plan

Please indicate in detail how you intend to finance your apprenticeship (see p. 18-19).
Please send a letter of application, your essay, financial plan, Release Form, Personal Data Form and $50 processing fee to:

Ecology Actions' Mini-Farm Apprenticeship
5798 Ridgewood Road
Willits CA 95490-9730 U.S.A.

We hope the decision process will be as creative for you as it is for us, and we hope to hear from you soon!

The Renewal Process

Once a person is in the apprenticeship program, a written request must be made three months before the end of the first and second years if he or she wishes to continue in the program. This booklet, "Apprentice Opportunities", should be reread before requesting to continue to ensure that the apprentice's goals can be met within the program. Otherwise, it will be assumed that this person wishes to leave at the end of the first, or second year. Upon receiving a request to continue, Ecology Action staff will review it and respond with a decision within one month. If an apprentice wishes to become a short-term (one to two additional years), medium-term (three to seven additional years) or long-term (eight to fifteen additional years or more) GROW BIOINTENSIVE sustainable Mini-Farming program staff Farmer/Teacher/ Trainer, a written request must be made six months before the end of the third year. Long-term staff provides all-important continuity for the research and for interns, apprentices, other students and the outreach program as a whole.

Change of Status

If the apprenticeship is not working from the point of view of the apprentice or Ecology Action's senior staff, either party may decide to discontinue the relationship. For those apprentices deciding that the type of work in the Ecology Action program is not right for them, a notice of at least one month, and preferably three months, is appreciated.

PROCEDURAL SCHEDULE FOR APPRENTICESHIP APPLICATION PROCESS

•Do required reading

•Visit at scheduled time—Tour or Three-Day Workshop at Willits
(see growbiointensive.org/events_main.html)

•Send in application materials (Date sent: _____)

- ☐ Application (see p.25)
- ☐ Financial plan (see p. 27)
- ☐ Release Form
- ☐ Personal Data Form
- ☐ $50 processing fee

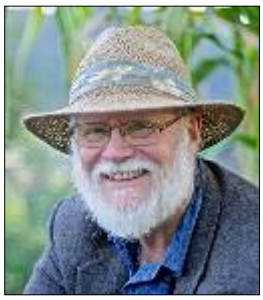
☐ Ecology Action consideration of application, which may involve a two- to six-month dialogue

☐ In-depth visit arranged by Ecology Action

☐ Final decision

ECOLOGY ACTION STAFF
Willits, California

The Jeavons Center Mini-Farm is under the direction of Ecology Action President and Executive Director, John Jeavons. John will teach interns, apprentices and students at the Willits site.



John Jeavons, President and Executive Director of Ecology Action, has been Director of the Mini-Farming Program since 1972 and is the author of *How to Grow More Vegetables* ... on GROW BIOINTENSIVE sustainable mini-farming, which is currently used successfully in over 152 countries in English, Spanish, French, German, Hindi, Russian, Arabic, and Kiswahili. He is author, co-author and/or editor of over 40 other Ecology Action publications. His major responsibilities include directing field and library research and education in GROW BIOINTENSIVE food-raising. He advises GROW BIOINTENSIVE projects in Mexico, Kenya, Ecuador, Russia, and Afghanistan as well as all corners of the US. Jeavons holds a B.A. in Political Science from Yale University. Before coming to Ecology Action in 1971, he worked as a systems analyst in business, government and university settings. He has received the Boise Peace Quilt, Santa Fe Living Treasure, Giraffe, and Steward of Sustainable Agriculture awards for his public service.

The Victory Gardens for Peace Mini-Farm is under the direction of Ecology Action Vice President, Matt Drewno. Matt will teach interns, apprentices and students at the town of Mendocino site.

Matt Drewno, Vice President of Ecology Action and Manager of Victory Garden for Peace Mini-Farm, a research, education and demonstration mini-farm and the Victory Garden for Peace Seed Bank in Mendocino, California. Drewno is a GROW BIOINTENSIVE Certified Master-Level Teacher and has been working with Ecology Action since 2010 training individuals and communities in the principles of biologically intensive food production. He is also certified in permaculture and restoration of oak-savanna ecologies. Drewno holds a Bachelors of Architecture from Iowa State University. His experience includes organic farm-scale food production, design and implementation of food forests, residential-scale food production and community gardens.

In Defense of "Old-Fashioned" Training*

Hartmut von Jeetze

The question is often asked, "How can I become a Biodynamic farmer or gardener?" Of course it is best for anyone who really wishes to follow that calling to find a place where he can get training. I will make an attempt, however, to describe some methods which an aspiring farmer or gardener may be able to apply, even if he does not yet happen to be on a Biodynamic farm or garden.

What I will describe was, only a short time ago, considered an indispensable part of any training. It is still mentioned in text books today, although in books on Biodynamic agriculture it is more apt to appear between the lines. To an experienced farmer or gardener, therefore, I am not really saying anything new. At a time when mechanized operations and fast returns are the order of the day, I hope only to throw some light on what no longer appears on the surface.

Anyone traveling through the Amish country or on the European continent will find one thing common to the farmers in these areas: an almost ritualistic **devotion to order**. Order permeates every facet of work and life on the farm and in the garden. If you had the opportunity to be an apprentice on one of these farms, you would probably find that, for the first year or two, more emphasis would be placed on the acquisition of certain skills than on what might seem directly related to farming or gardening. Nowadays, such an emphasis is often considered petty, although, as we shall see, there are good reasons behind it.

Today's virtual separation between the attitude of the person performing a job, and the actual product or work, may be considered a necessary evolutionary step. In earlier days, the manner of working was an inseparable part of the created product. We need only think of the old craftsmen, although many other examples could be given. Here, as Goethe said, "The what bethinks, yet more the how."

Our relation to labor today, largely the result of automation, has changed all this. However, while an engineer who does a poor job designing a bridge will have to face up to the consequences of his negligence, the same laxness in professions dealing with living organisms (e.g. farming and gardening) may not have such immediate and obvious results. And yet it is precisely in the area of working with living organisms that **sensitivity** is required as a first condition; without it, we cannot even realize what domain we are in as we work on a farm or in a garden. Considering this, we may not find it hard to believe that the old-fashioned steps of training—leading from apprentice through journeyman to master—may have had a purpose. Some of these steps shall, therefore, be described below. (I might add that, in earlier times, an apprentice often had to pay for his training, and certainly never received anything, to begin with, except board and lodging. Think of college students today.)

The initial step, for one who enters upon the path of learning a trade—such as an apprentice in Biodynamic agriculture—is **the acquisition and development of certain disciplines** to the point where they become second nature. These disciplines are quite simple, and the first one—already mentioned above—is **order**. What does order have to do with farming? At the very least, it must be agreed, a farmer whose house, barn, tool shed, field, etc. are in order will have everything he needs at his fingertips. Such order may be difficult to achieve at first; life itself must often come to one's aid. Imagine, for example, that you are plowing, have to stop for a repair, and find that you left the hammer lying on the tractor wheel, at the last fixing job ten furrows back. Or you are trying to attach

*Used with permission from BIODYNAMICS Magazine, Spring 1977, #122, pp. 7-11 and Summer 1977, #123, pp. 23-26. [Emphases added by Ecology Action.]

a trailer to your tractor, with the boss standing by; when you remember that you left the hitch pin on the bench in the tool shed, half a mile away! Few of us have escaped such lessons.

It is the effort that counts, however, and one day the apprentice will see that his attempts to achieve order are paying off. Not only will he find things at his fingertips when he needs them, but he will eventually discover that orderliness has an immense power to turn things around him into willing servants in the execution of his work. They become just as helpful as the orderly thoughts necessary to an engineer, for example, if he is to be successful in his trade.

All experienced farmers can confirm that this is so. An old hand will be unable to walk past a pitchfork negligently left lying on the barn floor, or placed prongs up in the corner, by some novice. He will instinctively grab the fork and place it securely, probably thinking, "I wonder who will look for this tomorrow morning!" Or consider the nail carelessly dropped in the farmyard. There will most likely be a hot afternoon, with a storm on the way, when the tire of your hay wagon will pick it up, or—even worse—an ailing cow may unsuspectingly swallow it.

Many an eager beginner in the all-out attempt to bring order into his life finds that almost everything, as if by agreement, seems determined to defeat him. Although it will not necessarily happen to everyone, most of us have experienced frustration when a tool that was always there suddenly vanishes, or when the pin that has held a piece of equipment together for years breaks on the very day when we actually arranged everything *well*, and work is finally progressing smoothly.

We should not be deterred or discouraged by all this. We must realize that our efforts are strong enough to be causing a response—and that we still have much to learn. One problem may be that we do not yet have the appropriate inner relationship to the things we come in contact with. Perhaps we are too eager in our efforts, in which case things will have a way of breaking or going wrong under our fingers; or maybe we are not yet really "there", with our mind on the job, and so objects continually get lost.

To help the novice over this hurdle, a second discipline is necessary: **the ability to submit oneself completely to doing what one is asked to do**. Again, obedience to this discipline may be hard at first. There are so many times when what we have been told to do could be done differently, or with much less effort, or perhaps more efficiently with a machine.

But right here is the crux of the matter. At this stage of our training, it is not a question of how we can do something easier, quicker or better. The real point is that a certain inner strength and quality—which we alone can develop—must not be dissipated too soon in outward concerns but allowed to grow within us. As the germinal force of the sprouting seed has to be held back for a while, if a strong bud is to develop, the willingness to do what is asked, without questioning motives or pushing alternatives, gives strength to a special virtue that is well worth every bit of effort.

The apprentice who persists long enough in this discipline will, sooner or later, discover stability within himself that he has not known before; perhaps he hasn't even suspected that it could exist. The fruits of obedience will also give him sensitivity to his surroundings by virtue of which he will approach an understanding of inner, universal laws. This will help him to overcome the "bad luck" syndrome. As he discovers that "efficiency" is beginning to become his companion, he can experience it as a kind of inner space, existing between the person and the things around him.

Everyone is familiar with repetitive work. It has a flavor of its own, especially for beginners. Confronted with the task of singling turnips, weeding, picking stones, or any similar work for eight to ten hours a day, in a field that may take weeks to complete, one can learn a great deal—and not only about the weather.

An apprentice placed in such a job for the first time soon finds himself surrounded by what seems to be an endless sea of plants, weeds or stones—alone. Any old hands who may have started out together with him have moved out of talking distance, if not out of sight, by dint of their ease of movement and skill. Thus, left to himself, the beginner finds that time seems to stretch almost as long as the rows of plants before him. Aching backs or hands and other discomforts may add to his plight. Situations like this may well test the apprentice's vow to his chosen profession.

Sticking to one's guns in this test is, however, essential; if we persist in our task, we soon develop skill. Moreover, we soon discover a certain rhythm of movement contained in all repetitive work. Once we have found this rhythm we have gained a powerful ally. For it is as if this rhythm would lend to us its own strength. With its aid we soon learn to move through the weaving rows with the same swiftness as the experienced worker. An inner stability begins to manifest itself in our work, making us immune to the change of weather, to boredom, or to any other irritations that had beset us to begin with.

Finally, the **submission to repetitive tasks** will engender in us an equanimity unknown to us before. Once we have reached this point in our apprenticeship we have gained a great deal. We have not only learned something about work, but about ourselves. We have gained a certain detachment from ourselves, giving us a new relation to the element of time. We know now how much can be done in a given time. We can move on.

At this stage in our training we will find ourselves involved in all manner of tasks in and around the farm. Most tasks will be known to us by now and we are actually well on the way to becoming journeymen. What we will now need is **perseverance**.

Few things foster skill and strength more than perseverance. I remember well a situation which I considered insoluble. One day, having to replace a broken part on a plough, I found myself hopelessly stuck trying to dismantle certain parts. Just then the farmer happened to come by and looked at the plough for a few moments. Then he looked at me and said, "If man has put it together he can also take it apart," and walked on. I succeeded. Recollection of this situation has helped me many times since. Perseverance duly practiced not only gives us outer strength. It lends certainty and tranquility to all our work. Its result is an outgoing efficiency, which will begin to permeate all our work.

An old proverb says: “There are no dirty jobs on a farm.” Few apprentices realize the wisdom of this proverb. We may have come very far in our knowledge about farming practices before we are faced with the full weight of this statement. For we will probably be a good way into the journeyman stage of our training before we realize how much preference we still carry in us for certain jobs rather than others. Yet, if we wish to aspire to mastery of the trade, preference for some jobs over others is a barrier we have to overcome. Only the ability to turn to one job, with the same fullness of attention as to another apparently less enjoyable, leads to that flexibility, openness, and ability to judge situations which we need if we want to stand responsible for our trade. **Non-preference**, if acquired, leads to freedom from self in all we do.

Lastly, a trainee who has acquired the five virtues previously outlined will, if he wants these to be effective in his daily life, have to pay attention so that they do not get lost. A sixth exercise or step, therefore, consists in **devoting attention to all the above virtues**, to the point where they become an inseparable part of him. He who achieves this will find a way to harmony with himself and the world. He will also gain a living relationship to the land, which will help him a long way on the road to mastery of his trade. He will acquire a certain gratitude towards his daily work.

The careful reader may find that the above stages, described as part of an outer training, contain the same elements which Rudolf Steiner gave as subsidiary exercises for those who want to go a path of inner development. To those who may ask if such a parallel is justified, I should like to say, "Is there any true outer training which is not at the same time an inner one?"

1. Order
2. The ability to submit oneself completely to doing what one is asked to do
3. Submission to repetitive tasks
4. Perseverance
5. Non-preference

OTHER LEARNING OPPORTUNITIES AND APPRENTICE PROGRAMS

You can learn almost everything you need to know about GROW BIOINTENSIVE from our publications. But you may still want a more formal working-learning experience to fully develop your skills. You may also find that working and learning with others is a rewarding experience.

This list of references for hands-on training contains two types of listings:

- Those that offer programs themselves;
- those that serve as networking liaisons.

Remember when you contact any of these people, tell them why you are writing and a little about yourself, and give them a general idea of what you are looking for. This will help them help you. If you make an agreement and commit yourself for a period of time, make every effort to keep your commitment.

The following entries marked with an asterisk (*) have programs that teach Biointensive or Biointensive-type methods.

* Agroecology Program, Department of Environmental Studies, University of California, Santa Cruz, CA 95064. https://casfs.ucsc.edu/.

This program was started as an adjunct to the Farm and Garden Program (see below) and is now a permanent program with the University of California. Agroecology, as a field of study, is based on the application of ecological principles to the design and management of agricultural systems. Headed by Steve Gliessman, this group is working toward the development of ecologically, socially, and economically sustainable agricultural systems through their ongoing research and education program. Write for details, costs, and college credits and criteria.

Appropriate Technology Transfer for Rural Areas, ATTRA P.O. Box 3657, Fayetteville, Arkansas 72702. https://attra.ncat.org/.

Alternative Farming Systems Information Center, (AFSIC) USDA, National Agricultural Library—Rm. 11, 10301 Baltimore Blvd., Beltsville, MD 20705-2351. https://www.nal.usda.gov/afsic.

"Educational and Training Opportunities in Sustainable Agriculture", 5th edition, November 1992.

Angelic Organics CSA, 1547 Rockton Rd., Caledonia IL 61011. https://angelicorganics.com/.
Phone: (815) 389-2746

This is a 300-member Biodynamic CSA farm which strives to create a healthy balance between work, study and creativity. Housing and a stipend is offered. Previous farm experience and a multi-year commitment valued. Main season: March-November; additional openings: May-September. Request their Introductory Booklet.

Aprovecho Research Center, 80574 Hazelton Rd., Cottage Grove, OR 97424. www.aprovecho.net/.
Phone: (541) 942-8198

Located about twenty minutes from Eugene, OR, Aprovecho offers intensive two-and-a-half-month internships in simple living skills, focusing on sustainable forestry, organic gardening, appropriate technology and indigenous arts and skills. Also publishes *News from Aprovecho*. Inventors of the simple, energy-efficient Lorena cook stove.

Phone: (800) 346-9140

Two ATTRA Resource Lists are available for extension agents, agricultural support groups, researchers, educators, and agribusinesses. Also Sustainable Agriculture, University Programs and Contacts, and Internships, Apprenticeships, Sustainable curricula including on-farm experience, and working farm programs in the US.

Biodynamic Farming and Gardening Association, National Headquarters, PO Box 550, Kimberton, PA 19442.
www.biodynamics.com/who-we-are.

Has lists of farmers throughout the US. practicing Bio-Dynamic techniques on the farm and in the garden and can direct (or redirect) inquiries directly to farmers.

California Certified Organic Farmers (CCOF), 303 Potrero St., Ste. 51, Santa Cruz, CA 95060. www.ccof.org/
Phone: (408) 423-2263

Provides a list of members who offer apprenticeships.

California FarmLink, 1823 Eleventh St., Sacramento, CA 95814.
www.californiafarmlink.org/.
Phone: (916) 443-4225

Assists retiring farmers who want their land to stay in agriculture and aspiring farmers who want help getting started in farming.

*Camp Joy Gardens, 131 Camp Joy Rd., Boulder Creek, CA 95006.
campjoygardens.org/.

Camp Joy operates a small (4 acres) family farm in the Santa Cruz Mountains and grow a wide array of vegetables, fruit, flowers, and herbs for themselves, local markets, and "to encourage a healthy plant and animal community" in their immediate environs. They have a summer apprentice program, classes/workshops, garden tours, and a work-exchange-for-produce program. Open to adults and children (no dogs, please). A flexible contribution of $50-$100 per month to offset food and utility expenses can be worked out. Write about your interest in gardening, living collectively, and pertinent experiences you have had.

Centre for Alternative Technology, (CAT) Machynlleth, Wales, SY20-9AZ United Kingdom. cat.org.uk/.
Phone: 0654-2400.

Located north of Aberystwyth near the west coast of mid-Wales, the Centre for Alternative Technology is open to the public and receives about 55,000 visitors each year. With working displays of small-scale solar, wind, and water power, low-energy buildings, organic growing and nature conservation, the Centre offers a wide array of two- to seven-day courses—from blacksmithing and wind power to woodland skills and coppice crafts. Accommodations are provided, and rates are charged on a sliding scale according to ability to pay. Write for complete course listing and rates.

* Farm and Garden Apprenticeship, 1156 High Street, University of California, Santa Cruz, CA 95064.
https://casfs.ucsc.edu/apprenticeship/apprenticeship-information/index.html.
Phone: (408) 459-4140

These gardens were first established by the late Alan Chadwick at the invitation of the University of California. The apprentice program brings about 40 individuals from around the world for a 6-month course of study and hands-on experience in the garden. Write for details.

* Hedgerow Farms, 8328 Valmont Rd., Boulder, CO 80301.
www.vegguide.org/entry/232.
Phone: (303) 666-4566

Organic Farm Opportunity/Market Garden Internship: Hedgerow Farms is a Colorado Certified Organic market, garden, and nursery,

situated on 20 acres near Boulder, Colorado. They produce vegetables, cut flowers, and culinary herbs for the Boulder Farmers Market and for their subscription service. Hedgerow is affiliated with the Naropa Institute in Boulder and is involved in educational activities. They are in need of a full-time intern to assist in production and marketing from mid-spring through mid-fall. The internship involves varied physically demanding tasks and skills, like preparing the soil, weeding, watering, compost building, harvesting, and selling at the Farmers Market. The intern will "learn by doing", gaining experience in the Biointensive method in a semi-arid climate on the high plains. The prospective intern should have some educational and/or work experience in horticulture or gardening, and must be dedicated to organic agriculture. In exchange for full-time work, there is housing, food from the garden when available, a monthly stipend, and Worker's Compensation coverage. Please send cover letter and resume to the above address.

Maine Organic Gardeners and Farmers Association (MOGFA), Apprenticeship Placement Service, PO Box 2176, Augusta, ME 04330. www.mofga.org/.

MOGFA's placement service matches up prospective apprentices and farmers in Maine according to information submitted on their respective application forms. Open to men and women 18 years and older with or without previous experience. Typical apprenticeships run from May to September, but can continue into the winter. A non-refundable application fee is required to help cover the cost of the program.

Michael Fields Agricultural Institute, W2493 County Road ES, East Troy, WI 53120. http://michaelfields.org/.
Phone: (414) 642-3303

Their Educational Activities update lists apprenticeship positions on organic farms, mostly in the Midwest. They offer a two-year training program with practical instruction in all facets of organic, sustainable agriculture as well as training in and studies of holistic farm and garden management systems, primarily but not exclusively of Biodynamic origin.

New England Small Farm Institute, (NESFI) P.O. Box 608, Belchertown, MA 01007. www.smallfarm.org.
Phone: (413) 323-4531

Ohio Ecological Food and Farm Association, Farm Apprenticeship Program, (EOFFA) 1735 Neil Ave., Columbus, OH 43210. http://policy.oeffa.org/apprentice.
Phone: (614) 292-3786

This program matches apprentices and farmers, providing an opportunity to learn agricultural and homesteading skills and organic farming methods. Non-refundable application fee.

Ohio FarmLink Program www.farmlandinfo.org/ohio-farmlink-program.

Countryside Conservancy FarmLink Program works to keep Northeast Ohio's farmland in farming by helping connect those who need access to farmland with landowners who want to keep their property in agricultural use.

World Wide Opportunities on Organic Farms-Spain (WWOOF). https://wwoof.es/

Connecting farmers with organic farms and small holdings across Spain.

The Jeavons Center Mini-Farm 1995