

Growing Medicinal Plants on the Micro-Scale

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We in the United States who practice herbal medicine, grow herbs, or otherwise use herbs can sometimes romanticize other parts of the world over their great acceptance of herbal remedies. Truth be told, as compared to many countries of Europe and wealthy, industrialized nations in other parts of the world, the relative lower levels of regulation and the lack of licensing for herbalists has granted us a freedom of access and a diversity of products that can be greater than in some of those nations that have a higher mainstream acceptance of herbs. (Individualistic, freedom-oriented, "American cowboy" culture, having led us astray and caused so much grief around the world historically and in recent years, isn't necessarily all bad.) In this vein, one of the fascinating aspects of herbal medicine is the tremendous diversity of paths people take to get there. Some start in health care, or by working on their own health problems, and work backwards, if you will, to the plants. In other cases, people start as gardeners or growers, or perhaps have a calling. In all cases, the medicine will have its most healing potential when part of an overall more intimate relationship with the plant world, rather than just a question of being a disempowered consumer buying gentler, "natural" remedies in the health food store or coop rather than drugs in the pharmacy.



One of the major current challenges facing herbal medicine in the U.S. is the wide range in quality, and therefore efficacy, of the products on the market. The safety of herbal products and the safe use of herbs (not the same but overlapping topics) is often

misused and manipulated by those with a bias against herbs or an interest in maintaining our current drug-focused health care system. That said, herb quality is a major concern, both with imported and domestically produced remedies. The two most common causes of reported adverse reactions to herbal medicines are (1) misidentification of the plant, and (2) adulteration (the third is overdose). In other words most side effects from herbs are issues of quality, pointing out a still strong need for more conscientious and ethical growers and manufacturers.

In my case, the journey to herbal medicine started with the plants themselves, taking me through the trajectory, to put it very briefly, from learning identification of plants in the wild, to wild edibles, to organic gardening and permaculture, to using plants as medicine and growing herbs in a market garden for income, to practicing as an herbalist and growing herbs for medicine making. Currently I am growing herbs mainly to make tinctures, or liquid extracts, for clients. One overarching reason I do this is that my



passion for and interest in herbs extends to the plants themselves and our relationship with them, and growing is an intimate way to explore that relationship. But by making my own medicines I can also ensure a high quality remedy for the person who truly needs it, and at a more affordable price. (Unfortunately the same tension exists with herbs as it does with organic produce: what ought to be *the people's medicine* has in some contexts morphed into something trendy and sometimes too

costly for many, making direct access to less processed and high quality affordable remedies even more important.) One advantage to this business model is that, although subject to change, at this time the FDA has exempted practitioners who make medicines solely for their clients from having to comply with Good Manufacturing Practices, which can be onerous for a micro-scale herb company. Some investment in equipment and infrastructure is necessary of course, but far less than when selling tinctures or other processed herbal remedies to the public.

For about twelve years, up until 2010, I grew herbs on a market garden scale, but was always on the smaller end of the spectrum even in this category. For sales I concentrated mainly on selling to Herbalist and Alchemist, Inc., a small tincture company based in Washington NJ (www.herbalist-chemist.com). Like other top quality manufacturers they purchase certified organic whenever an herb is available as certified, and also prefers to buy from local growers whenever the quality they demand

is available, and in particular for those herbs they process fresh. I recognized this as a niche and decided that on a small market garden scale what made most sense was to:

- Cultivate a direct and close relationship with a buyer such as Herbalist and Alchemist that valued the highest quality and needed fresh delivery of certain herbs to replace those herbs shipped fresh overnight (which even when done very carefully can't compete with harvesting and delivering within hours)
- Focus on the specific niche of fresh herbs delivered immediately after harvest for processing. This accomplished two things: (1) it eliminated much of the infrastructure needed for drying and storing herbs (the only drying I did was on a very small scale and mainly for my own use, not for sale), and (2) reduced the amount of land needing cultivation and care since relative to dried herbs used for tea, a small quantity of herbs can be used to process into a substantial amount of liquid extract for a smaller size company.
- Concentrate on those herbs I could grow well on that scale; i.e. put aside thoughts of growing those most popular herbs that require more product and thus more land and work, such as St. Johns Wort or Echinacea, and concentrate on (1) common herbs such as lemon balm or motherwort that could still be produced on a micro-scale (annual sales of 40-80 lb fresh herb), and (2) less common herbs such as *Isatis tinctoria* (woad), *Withania somnifera* (ashwagandha), *Agrimonia eupatoria* (agrimony), or *Ocimum sanctum* (tulsi or holy basil).
- Charge high prices but couple that with high quality. I have found that many growers first starting out do not take quality as seriously as they need to, making necessary some post-delivery extra cleaning of the herbs if roots for instance have not been sufficiently washed, garbling if some quantity of weeds or other plants were inadvertently harvested with the herb, or trimming if flowering tops were harvested for example with too much stem. This of course opens an opportunity for those who are willing to put the time into taking this level of care before delivery.

As a result within a few years, despite my very small size I was one of the more significant suppliers to the company and was grossing roughly \$10,000 from little more than a quarter acre and wildcrafting of a handful of native and naturalized local plants. Throughout the market garden phase I maintained organic certification, first through NOFA-NJ then NOFA-NY, and have since let it lapse although my growing methods have not changed. Selling only directly to clients, I have not found certification to be necessary – in my experience a client has never asked for it, whereas a processor/manufacturer would often require it.

The growing of herbs presents several opportunities to organic farmers and gardeners. For the home gardener, the cultivation of medicinal plants can add biological and aesthetic diversity to the garden, as well as providing herbs for home use. For the small-scale grower, the cultivation of medicinal plants can represent a market waiting to be tapped into. There is currently in the U.S. more demand for herbs than there is

domestic supply and a large percentage of herbal medicines used here are imported. This is also specifically if not even more true for the Northeast region, i.e. just as with consuming vegetables, countless people in our region are using herbs every day that could be grown here but are not. Many Chinese / Eastern Asian herbs, for instance, grow quite well in the northeastern United States. Some can be challenging but others are not difficult at all, and over the years I have successfully grown herbs such as Dang shen (*Codonopsis pilosula*) and Huang qin (*Scutellaria baicalensis*) that are commonly used in Traditional Chinese Medicine (TCM). I personally know several acupuncturist/herbalists practicing in New York City who prefer to buy domestically grown, organic herbs whenever possible – which isn't often.

At the same time there are some medicinal plants that are being overharvested in the wild and should not be wildcrafted for sale of any kind, including some well known herbs such as black cohosh (*Actaea racemosa*), goldenseal, (*Hydrastis canadensis*) and American ginseng (*Panax quinquefolius*).

For these reasons every current and potential herb grower should consider if there are plants that he/she could successfully cultivate that are (1) threatened plants, or (2) Chinese or other (non-invasive) non-natives that are not currently widely available as cultivated and organic. Most importantly in my opinion, this is an ethical and ecological choice. But in this case market opportunities coincide nicely with “doing the right thing”. Here in the Northeast we have two invaluable resources in this area:

- United Plants Savers (www.unitedplantsavers.org), which educates herbalists, growers, and the public about threatened and overharvested plants and cultivation methods.
- High Falls Garden: (www.highfallsgardens.net) which is conducting trials as well as educating growers on the need to cultivate organic Chinese herbs, both to provide higher quality herbs to all the practitioners of TCM and their clients, and to support local growers and the regional economy.

Ginseng provides the classic and perhaps best example of this. Ever since the earliest colonial times European-descended people have been harvesting our native ginseng (*P.quinquefolius*) for export to Asia, where wild plants are now all but gone, and it is only relatively recently that we are beginning to use it here in significant quantities. In the American Dispensatory of 1827, Dr. John Redman Coxe of Philadelphia writes that

The Chinese, probably on account of its scarcity, have a very extraordinary opinion of the virtue of this root, so that it sells for many times its weight in silver. The Americans, on the contrary disregard it, because it is found plentifully in their woods.

What a lesson Coxe send us from 175 years ago – that so often we search out the exotic and expensive, ignoring what is commonplace until it is almost gone.

A small-scale organic grower will never be able to compete with what I call “mini-mart ginseng”, which (to the degree to which it is ginseng at all) is grown in open field cultivation under shade cloth, and tends to require high amounts of chemicals, particularly fungicides. This is because ginseng grown out of its natural environment is highly prone to fungal disease. This is as true for domestically grown ginseng as it is for imported ginseng, although the imported roots (as well as other herbs) could have been grown with chemicals that have been banned in the U.S., or further fumigated before allowed entry into the country.

By growing herbs such as ginseng in our woodlots, we are not only producing high quality medicine for those who need it. We are not only providing income for small-scale growers. We are also repopulating the woods with a local, native plant that has been over-harvested for centuries, to the point where its survival in the wild is now threatened, while at the same time taking pressure off the wild ginseng by providing an alternative for those wanting to consume it. Ginseng also illustrates how cultivating medicinal plants, potentially along with food crops, can dramatically increase the biodiversity on a piece of land as well as make it possible to make practical use of many more micro-ecosystems.

In general when people refer to herbs they are using the folk definition of the word, “a plant or plant part valued for its medicinal, savory, or aromatic qualities” (Merriam Webster), when in fact when we are discussing “herbs” we are of course referring to trees, shrubs, herbaceous annuals and perennials, and even fungi which of course are not plants at all (or even closely related). This is important in its implications for us as growers and stewards of the land. The diversity of medicinal plants, even when limited to those that will grow in our area, is enormous. Along with that, the growing methods for these plants are equally diverse. Of course this is true for food crops as well, but the truth is that for the most part the common food crops tend to be field crops, and they all tend to do well in a well-drained nutrient rich soil with high organic matter content and balanced pH. In the case of medicinal plants, investigating the needs and growing habits of each medicinal plant is crucial. These needs can range from full sun to full shade, from a highly fertile soil to a low nitrogen environment, from well-drained soil (even dry conditions) to outright sogginess. Some are propagated by seed (direct seeded or transplants), others by cuttings, still others by rootstock. Some medicinal plants might be grown in crop rotations with vegetable crops, others might serve as living mulches or perennial beds, or canopies over shade-loving crops.

For people thinking about growing medicinal plants I would advise paying attention to the following:

- 1. Take a look at what is already on your land** – You may very well have a good crop of medicinal plants already growing on your land! Some commonly found plants in our area that have a market include poke (*Phytolacca americana*), dandelion

(*Taraxacum officinale*), violet (*Viola sororia* subsp. *papillonaciae*), and black walnut (*Juglans nigra*). I never actually planted violet or dandelion, but in both cases simply by giving the naturally occurring plants some love (weeding around them, enriching their soil), within a few years I was selling both. Besides becoming a crop in its own right, I was also able to nourish the violet into a living mulch for some of my taller perennials such as motherwort and Echinacea. Another example would be blue vervain (*Verbena hastata*), a wonderful nervine herb that grows naturally around my garden and that I have encouraged into a larger stand.

2. Classify the micro-ecosystems on your property. Again, some medicinal plants grow in habitats no typical garden plant would. What medicinal plants to add to your good garden soil will be the easy part; first take a look at all parts of your property with “a new eye”. Some herbs such as Astragalus (*Astragalus membranaceus*) are actually more medicinally active when grown in a low nitrogen soil (being a member of the Fabaceae family, it fixes its own nitrogen).



This may allow you to make use of parts of your property you have until now considered unproductive, and without disturbing the ecosystem naturally present. For example, on wetter ground that I would never cultivate I have encouraged naturally occurring stands of bugleweed (*Lycopus* spp.), skullcap (*Scutellaria laterifolia*), and rattlesnake master (*Eryngium yuccifolium*).

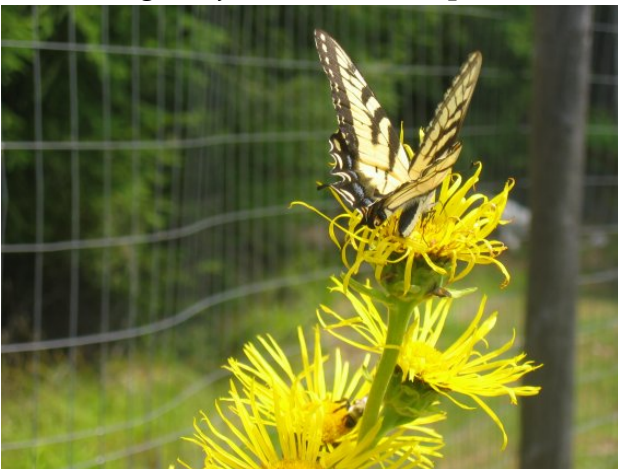
3. Choose the right variety. Sometimes people ask, how do I know what variety to choose when growing a plant for its medicinal uses? This is a critical question, with a fairly simple answer: when growing a plant for medicine, *always choose a non-hybridized, and as much as possible, non-domesticated variety*. In other words, don't choose a variety at all but rather the closest to the original wild prototype as possible.

- Don't fall for companies' pitches of varieties that are higher in “active constituents” than other varieties. The whole concept of standardization in herbal medicines, in which consistent levels of “active ingredients” are guaranteed, has been shown to be more hype than substance. For instance, in the case of Saint Johnswort, the market is full of products standardized to hypericin content, despite the fact that the overwhelming evidence is that hypericin is not the active ingredient at all. In fact, the whole concept of “active ingredient” when it comes to medicinal plants is suspect, and is often more of a pseudo-scientific claim than a truly scientific one.
- Always cross reference with the Latin binomial names of the plants. This is far more important for medicinal plants than well-established vegetables (where perhaps a variety could be mislabeled, but a species is unlikely to be).

4. Take care with invasive plants. Some medicinal plants can be quite invasive. This makes them easy to grow, but we don't want to contribute to plants, particularly non-native plants, "escaping" from our gardens or farms to take over the neighborhood, and eventually the region. Some plants can be invasive if allowed to go to seed, such as motherwort (*Leonurus cardiaca*); others spread by rhizome, such as woad (*Isatis tinctoria*). Others will naturalize in your garden but at a fairly controllable rate, such as fennel or valerian. On the other hand, we can do our part to promote the use (and thus increased wildcrafting) of some invasive plants such as Japanese barberry (*Berberis thunbergii*) which in some cases can be used in place of goldenseal.

5. Consider secondary benefits of growing medicinal plants. Many medicinal plants carry added benefits to your garden or farm. A couple of these are:

- Aesthetic value – many medicinal plants have attractive foliage, and many more have beautiful flowers. A typical flower garden often contains many medicinal plants, even if the gardener doesn't know it. These include well known herbs such as purple coneflower (*Echinacea purpurea*), as well as others such as balloonflower (*Platycodon grandiflora*), a widely used expectorant and lung remedy in Asia.
- Attractive to beneficial insects – Even if you introduce beneficial insects to your land, they won't stay long if you don't provide them with the habitat they prefer. I have found that many of the medicinal plants I grow are wonderful at attracting beneficials, and every garden or farm would benefit by planting them in patches or intermittent rows. Almost any plant in either the Lamiaceae or Apiaceae families will do a good job. Some examples include lemon balm or holy basil (*Ocimum*



sanctum) in the Lamiaceae family, and fennel (*Foeniculum vulgare*) or lovage (*Levisticum officinale*) in the Apiaceae family. I have found Valerian (*Valeriana officinalis*) to also be excellent at attracting beneficial insects. I have also grown European figwort (*Scrophularia nodosa*), in the Scrophulariaceae family, and found it to be the *absolutely best bee plant I have ever seen*. It has an extremely

long flowering season; parts of the plant are producing seed while other parts are just coming into flower, and my figwort beds were literally buzzing with a wide variety of wild native bees all summer long. That said, I came to regret growing it as it turned out to be one of the more invasive plants I have grown if allowed to go to seed.

6. Correct harvesting. The market is full of herbs that are low quality because they have been harvested improperly. The main things to keep in mind are:

- Part of the plant that is used – Depending on the particular plant, the part to be harvested can be the seed, the fruit, the leaf, the flower, the root, or a combination thereof. Of course this is equally true of vegetables, but because we are more familiar with them we usually don't have to think much about this. When we say tomato, there's no doubt that we are talking about the fruit, but when we say Saint Johnswort for example, we need to learn that we are talking about the flower or the unopened flower buds. Or when we are talking about Echinacea, that we mean the root and/or the flower head. Using the wrong part can result in everything from a weak and diluted product as in the case of products made from the whole plant of Echinacea or St. Johnswort, to a potentially dangerous one. (As an aside, quality issues are also paramount to research and are often manipulated to distort scientific outcomes – for instance some articles published in medical journals announcing that a particular herb “does not work” have studied the wrong part of the herb.)
- Correct timing – Medicinal plants need to be harvested when the medicinally active part is at its peak. Again, this is no different from knowing to harvest lettuce before it begins to bolt.
- Fresh vs. dry – Most medicinal plants can be dried and used as tea or made into tinctures. Some, however, are only active one way or the other. Those crops that are only active fresh, such as Echinacea, need to be tinctured at home or sold to tincture companies immediately upon harvest. Of course this market would have to be lined up in advance.

In summary, it seems there are three broad categories of growing medicinals:

- In the home garden for one's own medicine, for beauty, and for filling an ecological niche such as companion planting, attracting beneficial insects, etc.
- On the market garden or farm scale for sales either directly, dried, or processed.
- That in-between stage I find myself in, growing to make medicines as part an overall herbal practice.

Even container gardening can produce enough of the right herbs for someone to make their own tinctures or other remedies at home.

Certainly readers of the Natural Farmer will already know that chemical-laden herbs will not provide good medicine. (Interestingly, studies have begun to show that organic herbs may also be higher in some of the secondary compounds responsible for medicinal activity, such as flavonoids and salicylates, as compared to conventionally grown herbs.) But I have seen that there is still a tremendous amount of education to be done. As herbal medicine has begun to go more mainstream there is more of the “Dr. Oz effect” – people seeking out herbs who do not know much at all about it and do not realize the importance of high quality, organic remedies. Some of these people will end up walking away from herbal medicine thinking it doesn't work simply because they used a poor-quality product. This represents a real challenge, but also a real opportunity: a marketing and business opportunity to be sure, but also an opportunity

to draw at least some of those people in to a closer relationship with their communities, regions, and ecosystems.