# EDIBLE WEEDS ON FARMS:

## NORTHEAST FARMER'S GUIDE TO SELF-GROWING VEGETABLES

BY TUSHA YAKOVLEVA

# THANK YOU !

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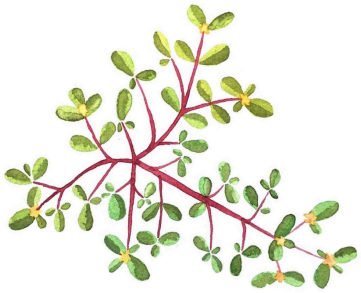

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BLAKE ARROWOOD, EDWARD BLAIN, ANTONIO DITOMASSO, DINA FALCONI, FAITH GILBERT, MARK KIMBALL, NATHAN KLEINMAN, AVERY MCGUIRE, LINDSAY NAPOLITANO, MATTHEW POTTEIGER, JORDAN SCHMIDT, PHILIP STARK, NICOLE STAROSIELSKI, TAYLOR TRIBBLE, KAREN WASHINGTON

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Sustainable Agriculture Research & Education

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# INTRODUCTION (ONE AND TWO)

## INTRODUCTION #1: WORDS THAT INTRODUCE THIS BOOK

I grew up gathering wild greens, mushrooms, and berries with my family. In Russia, where I am from, foraging for food and medicine is common practice. When I began farming in the Hudson Valley and Catskills region of New York in 2012, I noticed edible weeds familiar from childhood growing between the crops I was tending. That discovery rekindled my interest in foraging and - with the help of excellent mentors, books, and time - I began learning the edible landscape of the region. My path has only gotten weedier since. I met many others who also wanted to connect with their surrounding plants. I began sharing my wild harvests and teaching aspiring foragers. And through those activities, I found that wild edible plants were an excellent point of entry for conversations about environmental responsibility, community health, and biocultural belonging.

Living in the Hudson Valley, I witnessed a rising hunger for wild plants, for eating oneself into a sense of place. This desire grew so fast that essential aspects of relating to the land in reciprocal, responsible ways were not adopted by some newcomers to foraging. Some edible plants that grow slowly, live only specialized habitats, and cannot tolerate extensive disturbance were being overharvested for commercial purposes, without consideration for the livelihood of those species or the whole ecosystem. Meanwhile, weedy wild edibles grew prolifically in already disturbed habitats and were largely ignored by commercial harvesters. As a farmer and forager, I saw the potential for symbiotic connection between these trends. My favorite foraging grounds were the fields and field-edges where I grew crops, because this was where I could harvest an abundance and diversity of wild edible plants without concern about ecosystem harm. It seemed that other vegetable farmers were also well-positioned to harvest weedy edible plants: they already stewarded habitats - tilled soils - favored by weeds, and already had businesses set up for selling produce.

Through conversations with other farmers and my experience as a forager, it became clear to me that considering edible weeds as supplemental market crops was of interest to other growers. However, little information was available about how to manage, harvest, and share the stories of these unique crops with customers. I wrote a proposal to bridge this gap and am grateful that Northeast Sustainable Agriculture Research and Education Program considered it a topic relevant to the wider farming community.

*Edible Weeds on Farms: A Northeast Farmer's Guide to Self-Growing Vegetables* is a practical resource guide that aims to support and empower farmers wishing to add culinary weeds to their harvest lists. It is my attempt to redirect a hunger for wild foods away from sensitive species and toward the weedy abundance of plants that love to thrive under our feet.

### A NOTE ON LANGUAGE

Throughout this book, I use the terms edible weeds, culinary weeds, spontaneous vegetables, self-growing vegetables, and weedy edible plants interchangeably. Weeds are nourishing, resilient, powerful, culturally rich, ecologically essential, economically useful, and much maligned. Weeds, the word, carries a negative connotation - but is the most widely used term for the category of plants I discuss here. My hope is that by expanding its meaning to include the generous gifts of ruderal plants, this word will regain the comprehensive definition it deserves.

## INTRODUCTION #2: WHAT I REALLY WANT TO TELL YOU

I wish we didn't treat plants as transactional goods. I wish we didn't live in a world where nonhuman beings are treated as currency for fulfilling human wants rather than as creatures with whom we share a home.

But, this is not currently the state of our world. As such is our starting point, I am offering this small book as an aid for generating respectful, responsible, reciprocal relationships with the plants that are choosing to grow within the extractive system we have created.

This book is about so-called weeds, a term for plants that are encouraged to thrive and proliferate through our most common interactions with land, then vilified for getting in our way.

Weeds love disturbance and (most) humans love to disturb. And thus, humans and weeds share a long, intertwined history. For anyone who has ever turned the soil, weeds are our ancestry and our inheritance. One of my dearest mentors, Dr. Robin Wall Kimmerer, sees plants as relatives. In her book, *Braiding Sweetgrass*, she shares a beautiful vision for how kind the world could be if only we remembered our relations. For anyone who relies on agrarian food systems, weeds - of all plants - may be easiest to see as family. We travel the world together, we grow our families together, we are in a long-term commitment to help each other survive.

Many disparaging words have been written against this branch of our family. Weeds have been blamed for working against the goals of food production, for stealing resources from more-deserving plants, for growing too far, too fast, and without discernment. Yet, their wild bodies are filled with food and medicine. They show up as first responders when land is turned up-side down and stitch the soil back together again. They feed pollinators and protect waters when other plants cannot.

Weeds carry stories of cultural survival. They have shown up in the most challenging times to feed generations of starving people across the planet. They are culinary archivists connecting seemingly disparate communities through shared stories of overcoming hunger by calling on the nourishment of omnipresent plants.

This book is a small weight offered to rebalance the narrative that weeds are bad. That side of the story has already received ample attention. I present another side of the story as a reminder that we, as a species, live in the same world as all other creatures. There is much we don't know, so why not remain open to the possibility that even weeds have superpowers?

If I can choose only one thing for readers of this guide to carry forward, it's that nothing written here is new. This is information that was second-nature to most of our grandmothers, but has succumbed to intergenerational amnesia.

Tusha Yakovleva

# PART ONE

# WEEDS AND FARMS

# CHAPTER ONE

## AGRICULTURAL WEEDS, A BRIEF HISTORY OF WHAT WE FORGOT

What exactly is a weed? As Ralph Waldo Emerson diplomatically put it, "A plant whose virtues have not yet been discovered." The dictionary is cruder: "a wild plant growing where it is not wanted and in competition with cultivated plants." No botanical definition exists for this significant group of plants.

Perhaps they remain uncategorized because the concept is slippery, forever subject to context. There are no weeds in botany because the definition of a weed is in the eye of the weeder. Still, there are two general characteristics that unite weeds. First, they are vilified in most circles; the word itself - a stand-in for something undesirable and persistent. Second, most weeds occupy a specific ecological niche. The majority of plants considered agricultural weeds today are early succession species that thrive in disturbed soils. Put into other words, they are plants that thrive near people, since we are a species with a seemingly insatiable enthusiasm for moving soil. Weeds thrive on vegetable farms because annual agriculture perpetually resets the successional clock back to an ideal habitat for weeds.

"The soil under the grass is dreaming of a young forest, and under the pavement the soil is dreaming of grass." – Wendell Berry

It is worth considering that weeds did not exist before agriculture. Agricultural weeds were only defined as such once humans began cultivating fields, though the plant species in question long pre-date farming. Just a few millennia after the start of agricultural activity around the Mediterranean Basin, archeological evidence shows wild plants rapidly co-evolving along cultivated crops in areas where soil was disturbed by humans. 12,000 years later, so-called weeds and agriculture are still inextricable in their co-evolution. For example, Palmer Amaranth (*Amaranthus palmeri*) is defined as a "superweed" by large mono-crop farms and herbicide companies because it is a plant that frequently co-occurs in fields of soy, corn and other industrially-grown crops and has evolved a resistance to herbicides.

Today, a robust body of agricultural literature offers endless tips for battling weeds, while the question of whether this group of resilient, adaptable, spontaneously occurring plants belongs on a farm or in a garden is rarely addressed. The most popular methods of farming involve frequent soil disturbances and, in the act of turning soil, a farmer is essentially sowing weeds. Is it possible, then, that the relationship between farmers and weeds is closer to an age-old collaboration rather than forces working in opposition?

Within the loudest historical narratives, cultivated and wild plants are placed into an ever-widening dichotomy, with the positive attributes of weeds often silenced in lieu of the difficulties they offer farmers. This perspective leaves out not only the entwined ecological history of weeds and cultivated crops, but also the genetic collaborations between weeds and crops as well as the cultural collaborations between weeds and people.

There is no hard line between weeds and cultivated vegetables. The varieties that have come to be known as vegetables today are the product of weeds being selected and tended by countless generations of growers. This kind of plant-breeding occurs through spectacularly patient efforts by people who, with knowledge earned through deeply-rooted relationships with land, select wild plants for traits that provide generously to people. This work is not frozen in the past; it is ongoing, intergenerational, and has been undertaken primarily by indigenous communities across the planet. Present day wild plants continue to support agriculture by carrying beneficial genetic traits - such as increased nutrition, pest resistance, drought tolerance — that can, through natural crossings, be passed on to new cultivated varieties. Many crops of today were the

weeds of yesterday. Today's weeds may be the crops of tomorrow.

The cultural collaborations between plants and people constitute an immemorial practice. People have relied on plants for food, for medicine, for shelter, and for the fulfillment of countless other needs for as long as humankind has existed. Frequent or urgent needs were often met by plants that were most readily and abundantly accessible. Many such essential plants are now best known as weeds. Weed seeds travelled the world in the pockets of emigrants, carried with intention as precious holders of nourishment and healing. Dandelions (Taraxacum officinale), for example, proliferated in North America after European settlers planted them near their homesteads for both food and medicine. It wasn't until a century ago that their reputation soured and dandelions were no longer welcomed in to grow in front of homes.

Amaranth (Amaranthus spp.) is another illustrative example of a broken and nearly forgotten collaboration. Palmer amaranth, the aforementioned "superweed," as well as related species, are more nutritious wild vegetables than industrially-farmed commodity grains. Amaranth can withstand significant environmental stressors and still produce an abundance of complete-protein grains as well as a greens crop. A native of Mesoamerica and the Northern Andes, amaranth has been cultivated by indigenous cultures of those regions for at least 8,000 years. Now, in the United States, amaranth's reputation as a superfood contends with its reputation as a superweed which grows against the goals of food production.

The majority of today's weeds are plants that have served essential roles in the survival of our species. In certain times among certain cultures, these plants were valued, respected, and encouraged. Somewhere along the history of agriculture, the pressures of capital got mixed up with an affinity for grid lines and many of us forgot about the gifts of wild plants. Coaxing nutrition, medicine, and healthy soil came to be seen as the jurisdiction of precise science and the unruly, spontaneous ways of wild plants came to be seen as competing against the very gifts they provide.

None of the plant relationships described in these pages are new. We all have ancestors who tended weeds while sowing seeds. This book is simply a reminder to look underfoot at the generosity of plants we may have forgotten. Since weeds continue to luxuriate where cultivated crops are awaited, since the weeds and agriculture are intertwined with no end in sight, perhaps it is worthwhile for all growers to pause and ask if the two can grow together, and not against one another.

# CHAPTER TWO

## WEEDS AS FOOD

"When I got home from a few weeks of teaching in the field, my cupboard was bare, so I went to my garden to see if there was any spinach for dinner. It was way too small and puny looking to harvest but of course the weeds were thriving! So I ate them, instead.

Lamb's quarters or *Chenopodium album* makes the most delicious cooked greens, tender, silky and more flavorful than spinach. I like them with pasta, especially. Latin names can sometimes tell a good story – this one means the white goose-foot and its true – the leaves are shaped like a webbed foot and the whole plant is whitened by a powder of waxy bloom. I even like to eat the little ones raw as I pull them up from among the rows. They are super nutritious – way more so than the spinach I was looking for.

I love gardening but I have to admit that it seems like we've gotten it a bit backwards... pulling up the "weeds" like lamb's quarter which volunteer in our gardens and grow magnificently without benefit of planting or tending or fertilizer – displacing the wild so we can cultivate the domestic. A lot of "weeds" are just free vegetables without the work, free-range companions to the crops. Maybe next year I'll skip sowing spinach and let the lambs quarter run wild. I think I'll skip the grocery store this week, after all- there's sorrel and purslane and milkweed and day lilies and grape leaves and... more. Eat wild!"

– Robin Wall Kimmerer

For over a century, the loudest narratives about so-called weeds have framed them as obstacles to the goal of food production. Countless seeds have been bred in laboratories for the purposes of quickly taming wilder plants: teaching them to appease our collective sweet tooth, to perform with more predictability and convenience. Waterways have been diverted from feeding meadows of spontaneously occurring plants to instead irrigate foods grown in mono-crop formation. Billions of acres of forests have been flattened to make room for industrial agriculture.

The transition to industrial agriculture has been such a fast-paced, single-minded, place-less process that it is impossible to predict all of its impacts, especially those that reveal themselves gradually over time. One unexpected effect: our industrially-fed food system is revealing itself to be less nutritious. Many wild plants are dense in phytonutrients, while seeds best suited for large-scale agriculture have lower, diluted levels of phytonutrients. One cost of growing foods that can withstand herbicide applications and fare well during cross-continental travel is a new kind of hunger.

The diversity of the average person's diet has dropped drastically in the past century. From relying on hundreds of plants to feed ourselves, our species - at the global level - now derives half of our calories from three plants: rice, corn, and wheat. "The State of Food Security and Nutrition in the World," a 2018 report by the Food and Agriculture Organization of the United Nations (FAO), concluded that one in three people suffer from "hidden hunger," a micronutrient deficiency that occurs "when the quality of food that people eat does not meet their nutrients requirements […] such as the vitamins and minerals that they need for growth and development" (Dr. Anna Lartey, FAO). This problem is linked to a worldwide dwindling of dietary diversity.

"Two of the most nutritious plans in the world are weeds – lamb's quarters and purslane – and some of the healthiest traditional diets [...] make frequent use of wild greens." Michael Pollan, *In Defense of Food: An Eater's Manifesto*

Meanwhile, wild foods (as well as many traditionally bred cultivars) remain high in phytonutrients. They

contribute to general health and have been linked to reducing the risk of widespread modern ailments - including but not limited to cancer, cardiovascular disease, diabetes and dementia. Jo Robinson, an investigative journalist who has been researching the health benefits of wild and wild-like fruits and vegetables for the past two decades, argues that the loss of phytonutrients began thousands of years ago at the transition from foraging to agrarian lifestyles and has sped up significantly in the past century. In her book, *Eating on the Wild Side*, Robinson explains that many beneficial phytonutrients are bitter, sour or astringent in taste; early agrarians favored varieties with lower fiber content and higher sugar, oil, and starch levels. "These energy-dense plants were pleasurable to eat and provided the calories needed to fuel a strenuous lifestyle. The more palatable our fruits and vegetables became, however, the less advantageous they were for our health," Robinson writes. (Robinson, 2013, p. SR1). *Eating on the Wild Side* is a meticulous guide to selecting foods for maximal nutrition even when shopping in a grocery produce aisle. It is the wild foods, though, that Robinson - backed by scientific studies - credits with having the highest density and greatest spectrum of nutrients. Dandelions, for example, outcompeted the phytonutrient content of spinach seven-fold.

*Japanese knotweed shoots for pie filling*

To anyone who eats from the industrial food system, edible weeds also offer health benefits that go beyond nutrition. As plants growing outside the constraints of industrial production, wild foods are free of synthetic additives, wax treatment, irradiation, pesticide drift, or modified genetics.

It is an improbable and flawed idea to return to a world of gathering and hunting. Not everyone can "eat wild" for every meal, nor is it likely that the already-stressed plant and animal populations around the planet could support this practice. But, perhaps the average American diet could shift to include a few more wild weeds. At a time when malnourishment is on the rise and food insecurity is expected to increase as climate change impacts communities, it is irresponsible to dismiss edible weeds. They are readily available, climate change resilient, and low-energy-input sources of vitamins and minerals.

To a farmer, edible weeds provide an opportunity to share powerfully medicinal, nutritious foods with their community.

*Robinson, J.(2013, May 26).Breeding the Nutrition Out of Food.New York Times. p.SR1.Retrieved from http://www.nytimes.com*

# CHAPTER THREE

## WEEDS VERSUS FARMS

To choose the life of a farmer is to choose a life with weeds. For most growers of annual produce, weeding will always be on the chore list, an essential part of the seasonal cycle of growing food. As such is the reality, the only choice remaining is whether to live harmoniously with spontaneous plants that surround and move into tilled fields or to be in perpetual odds with them. When trying to coax a robust harvest from one sown seed, it may be hard for a grower to feel anything but friction with surrounding weeds. However, when looking at a farm as a complete ecosystem and the farmer as one of its guardians, weeds quickly take on new light as this untidy group of plants works tirelessly to protect and enrich the health and resilience of lands in agriculture.

What are the environmental benefits to managing a farmscape with weeds? What weeds offer a farm depends on the type of farmer and the kind of weed, but to all growers, wild plants provide a wealth of knowledge about the land. Wild plants are land stewards in the truest sense, dedicating their lives to one patch of earth. Any human aspiring to steward land can find benefit from listening to the creatures who have only ever been rooted in place.

### WHAT ECOLOGICAL GIFTS DO WEEDS GIVE TO FARMS?

The following is an introduction to the ecological services weeds provide on agricultural soils, followed by a few ecological challenges for farmers who choose to manage a weedy landscape to keep in mind. This list was compiled with the help of plant ecologist Dr. Antonio DiTomasso, Professor and Chair of the Soil and Crop Sciences Section and member of the Weed Ecology and Management Laboratory at Cornell University.

**Weeds are soil nutritionists.** Where annual crops are grown, weeds are the mediators between a grower and the soil. When nutrients are removed in the form of harvested food, weeds arrive quickly to rebalance the soil after it has been disturbed. Most weeds are pioneer species and many pioneers are dynamic nutrient accumulators, pulling up important minerals and trace elements from deep underground via their long taproots, storing them in their foliage, and making them accessible to other (shallower rooted) plants after they die, are cut back, or added to the compost pile.

Antonio DiTomasso: "These plants we call weeds, particularly the annuals, have a really important ecological role in repairing the land from disturbance, natural or human caused. I see them as secondary pioneers. Of course, if your focus is on harvesting crops for food, then they become primary competitors. Typical cropping systems, whether they are conventional or organic, are constantly pushing normal secondary succession back to the initial stage. Annual plants will colonize secondary successional stages early on and then condition or modify soil for the next group. In a sense they are the most problematic but they also fill this niche. So, that is the struggle."

**Weeds are soil protectors.** As they keep the soil covered at all times even when a field is fallow, weeds protect minerals and topsoil from eroding away in the wind or leaching away in excess rainwater. Weeds with deep taproots are efficient soil aerators, breaking up compacted surfaces where domesticated crops are unable. While weeds with clumping or hairnet root balls are excellent at holding soil in place, abating the risk of erosion.

DiTomasso: "Think about dandelion [*Taraxacum officinale*] and that taproot and what it's able to do to very compact soil or broadleaf plantain [*Plantago major*] - those roots are just neat! You don't have to get buckwheat, - weeds can be the cover crop."

**Weeds as soil translators**. Weeds can also be read as messages of the soil's needs. The presence of certain weeds, due to the particular nutritional cocktail they prefer, can reveal to a grower what type of discordance is hiding beneath the surface, signaling a time for amendments.

DiTomasso: "I use weeds as great indicators of soil condition. "For example, if you see red sorrel, *Rumex acetosella*, (the name suggests acetic acid) it indicates low pH and it's absolutely the case. Clearly, weeds are also finding their niche. They protect land where maybe another plant wouldn't be able to grow. Having that diversity is of value."

**Weeds enhance soil relations.** Left unpulled, either to mature and complete their life cycle or be trimmed down in the field, weeds condition the soil by enabling desirable habitats for tiny soil dwelling powerhouse creatures who, in turn, build rich soils. In addition, reducing tilling by leaving weed roots underground leaves mycorrhizal networks intact to serve as support channels for nutrient transport.

**Weeds build organic matter.** Annual farm weeds, the most common kind in regularly tilled fields, grow vigorously, quickly producing a lot of biomass before going to seed and dying within one growing season. In this way, they add significant organic matter back into hard-working soils, either as cut-and-come-again green mulch or left to decay in place.

**Weeds guard crops.** Farmer Bob Cannard, perhaps the most outspoken pro-weeds farmer in the United States, explains that among the long list of crucial services weeds provide to a farm, protecting crops is at the top. "We never wash our lettuces because weeds protect them from dirtiness," says Cannard. On Cannard's farm - Greenstring Farm in California's Bay Area - those same weeds also protect the crops from sunburn and early bolting, as well as deer herbivory. "The deer come to the garden at night, prune the amaranth and don't eat the vegetables," Cannard explains.

Taller weeds can provide delicate cultivated crops a barrier from destructive winds. Growers in milder climates with occasional cold fronts have used weeds

Joseph A. Cocannouer, a biologist before his time, is credited with authoring one of the first books in praise of agricultural weeds. In *Weeds: Guardians of the Soil*, Cocannouer makes a case for the ecological gifts of weeds on farms:

Removing substances from the soil in order to support life is of course the aim of agriculture; neglecting to keep up the fertility chain while doing it is poor farm management. It is invariable law that the farmer must put back quantity and quality into his surface soil for quantity and quality removed. That alone will maintain the soil-fertility chain. Rare is the farmer who does not have at his command the very materials that Nature herself uses in maintaining her primeval fertility, and usually in abundance: animal manures, compost materials, legumes and other green crops -- and deep-diving weeds.

Most wild plants have been forced, through their struggle for existence across the ages, to develop roots which will forage deeply for food and water under adverse conditions. The larger portion of domesticated crops, by virtue of their having been more or less pampered by man, have lost most of the soil-diving ability possessed by their wild ancestors -- if they happened to come from wild ancestors. What has happened is that most crops have received their improvement above ground; their root systems have grown weaker with civilization. The root vegetables are exceptions, of course. As a rule, crop roots are not fighters in soils where it requires a real struggle to make a go of it.

Aside from being husky divers, many wild plants have the ability to "eat" their way through compact soils because of special dissolving substances which they exude from their roots. The dissolving materials soften hard obstructions and thus aid root passage.

And there always seems to be room in the weed-root tunnels for the roots of cultivated crops. I have found the roots of some garden vegetables following the roots of pigweeds and lamb's quarter down into the subsoil, though ordinarily these same vegetables are not deep feeders. Beans and sweet corn and onions like to send their feeders into the lower soils along with those of the weeds. In a clean onion field the onions feed very close to the surface. Many normally shallow-feeding crops will forage deeply in a soil if the soil conditions are made right for them.

to protect crops against frost. By allowing a buffering band of weeds to grow on both sides of a bed, the weeds take on the brunt of frost damage, leaving the middle of the bed above freezing. If weeds are left to die in the field, they produce even more heat from the friction of decomposition.

Finally, some weeds can serve as trap crops: attracting pest insects away from cultivated produce and providing an alternate source of food or habitat. Lamb's quarters (Chenopodium album), for example, are appealing to leaf miners, stinging nettles (Urdica dioca) to aphids, and amaranth (Amaranthus spp.) to cucumber beetles.

**Weeds save water.** In addition to cooling the surface by keeping soils covered and thus increasing moisture retention, deep rooting weeds make more water available to domesticated crops (with shorter roots) by bringing water closer to the surface through the capillary movement along the exterior of their taproots.

**Weeds feed pollinators.** Often blooming weeks before a cultivated flower in their mad rush to reproduce, weedy blossoms can be an important supply of nectar to hungry pollinators in spring. Creating attractive habitats for beneficial insects on a farm can enhance pollination of fruits and vegetables and provide additional crop protection in the form of hundreds of tiny winged co-workers that predate on crop pests.

DiTomasso: "A beneficial insect may use a specific weed plant for housing or food. That diversity can be important. We need to be more holistic about it, at the end of the day. A few years ago when we had a big drought, the only thing left in my lawn were dandelions and plantain. Any Kentucky blue grass was gone. I remember wildlife feeding on these plants that were still green. The role that weeds play during drought is an important ecological role within the system."

**Weeds support farm animals.** Farmers who raise animals along with their weeds know that many wild plants provide delectable and nutritious fodder as well as bedding materials for many creatures, domesticated and wild.

Jordan Schmidt, who operates a grass-fed dairy with her partner Sarah Chase explains the value of weeds at Chaseholm Farm:

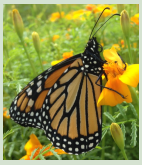
"Increasingly, we allow certain weeds to grow, or even plant them in our pasture for livestock health. Previously, most fields on our farm were rotationally mono-cropped and some were continuously grazed without rest. In transitioning to 100% grass-fed, the pasture becomes very important nutritionally for keeping your herd healthy. It's an especially high bar for nutrient flow, from having soils that are well-mineralized and have a good microbial life (which is what's circulating nutrients between the soil and the plant). Diversity in the field itself, whether that's having a good carbohydrate content or some of the phytochemistry in the plants we consider weeds like the bitters or the tannins end up having an important role to play in keeping microbial ecosystem of an animal balanced. Animals will pick what they need at any given time. One of our goals is to have options for them. We have one pasture we call "the herbal lay." It's an old idea, where livestock farmers would purposefully plant medicinals in certain pastures. Once a month, the cows would rotate through the herbal lay and self medicate."

**Weeds clean up messes.** Some common annual weeds have a knack for mining pollution from the soil. They are talented phytoremediators, often arriving as first responders to ameliorate a contaminated site. Although this, hopefully, is not a problem perpetuated by regenerative farmers, polluted soil may be a wound some growers are trying to heal on the land they tend. For this reason, it's important for all land stewards to be aware of this bioaccumulating superpower of weeds when making management decisions.

DiTomasso: "Some weed species play critical roles for nutrient uptake. Ragweed (*Ambrosia*

## A CALL TO FARMER-RESEARCHERS

***Integrating Insect, Resistance, and Floral Resource Management in Weed Control Decision-Making*** *- Weed Sciences Journal, 2016. Antonio DiTommaso, Kristine M. Averill, Michael P. Hoffmann, Jeffrey R. Fuchsberg, John E. Losey*



Research conducted by a team from Cornell Weed Ecology and Management Laboratory found that allowing common milkweed (*Asclepias syriaca*) to grow within a corn field (traditionally controlled with glyphosate in herbicide-tolerant corn), can improve management of European corn borer and thus reduce overall glyphosate usage.

Currently, in industrial agriculture systems, European corn borer is primarily controlled by a transgenic toxin, but this study concluded that milkweed plants - which harbor aphids - provide a food source for parasitoid wasps, which then attack corn borer eggs. Maintaining low-density milkweed populations within a field of corn minimizes yield losses from corn borer damage.

"Production management rarely considers the benefits of weeds in agricultural ecosystems," says DiTommaso. "If we open our eyes—even if it's a weed growing in the cornfield—we show it could be beneficial. Integrating weed benefits will become increasingly important, as pest management is likely to move from total reliance on herbicides and transgenic crop traits for control, because of increasing resistance of weeds to these products."

Entomology professor John Losey believes that all organisms in an agricultural system play varied roles, even weeds. "If management decisions are based solely on the negative aspects, yield and profit can be lost in the short term and broader problems can arise in the longer term," says Losey.

Weeds "can be a part of the restorative cycle," explains weed ecologist Kristin Averill. "It's very important to recognize the benefits of all the species within the crop field—that includes both the crops and the weeds—not to mention cover crops. Weeds can offer ecosystem services, such as soil erosion protection and pollination services for the benefit of insects," Averill argues.

While these findings may not sound revolutionary to farmers who already strive to enhance biodiversity and strengthen ecological balance of the land they tend, it is one of the few research studies that aims to quantify beneficial effects of agricultural weeds in a sea of academic papers that advocate for their removal.

Antonio DiTomasso encourages farmers to notice and share potential positive relationships between weeds and crop cultivation on their farms in the hope that such observations spur additional research in this under-explored subject.

*Sustainable Agriculture Research and Education, through which this guide is funded, is an excellent organization to seek support for such research. Contact information for SARE and Cornell Weed Ecology and Management Lab are listed in the back of this guide.*

*artemisiifolia*) can actually pick up heavy metals. You often see these plants along highways, the first half-foot off the road, which is a problem but it's also the only plant that can hang there because of salinity."

**Weeds are reservoirs of genetic diversity.** Edible weeds and cultivated vegetables are close kin; the distinction between them is subjective and temporal. Weedy ancestors of today's commonly-grown edible plants are also known as *crops wild relatives*. More and more, they are being recognized across the planet for the vast store of genetic diversity as well as place-specific environmental adaptation and resilience they carry in their wild bodies. Especially in times of acute ecological uncertainty, their long-term "memories" may offer life-saving food security.

DiTomasso: "When you think about ecological roles, think about the genetic perspective. Especially now with all of this gene technology, some of the traits weed species have, we wish some of our crops had: competitive ability, growth. Just as a reservoir of genetic diversity, it's critically important to have these plants. When you think about the world where 98% of soybeans are genetically engineered, weeds are another genetic reservoir that can help down the road for diseases and so forth."

## ECOLOGICAL CHALLENGES OF WEEDS ON FARMS

**Competition**. Plants, whether sown or spontaneous, want to live. They gather available resources in order to survive and grow the next generation. The long accepted view in ecology that all plants compete with one another and only look out for their individual well-being is being debunked by recent studies that show some plants not only co-exist, but help one another thrive. In other words: it's complicated.

DiTomasso: "From a weed ecologist perspective, my colleagues and I do research in this area, and obviously weeds are problematic to crops because of the competition aspect. But i think we can also really appreciate what they are capable of doing and their will to survive. That's unbelievable. And, that's important."

**Allelopathy**. Some weeds protect their growing space from other plants by putting up a chemical barrier. They release compounds into the soil that hinder the growth of neighboring plants. The impact of allelopathy is difficult to isolate, as plants are also influenced by many other environmental factors. Annual edible weeds that have exhibited mild allelopathic effects in certain conditions include lamb's quarters (*Chenopodium album*) and amaranth (*Amaranthus spp*). One (biennial) edible weed that is infamously allopathic is garlic mustard (*Alliaria petiolata*).

**Pests and pathogens.** Inviting species diversity into row agriculture does ask a grower to give away some control and embrace the risk of short-term crop casualties for the longer-term goals of growing and harvesting an ecosystem into balance.

DiTomasso: "A number of weeds harbor pathogens and crop pests. That is something one needs to be aware of. I've seen situations where this weed is an alternate host for this virus. If it's around the field edge and you get thrips or aphids, you can transmit this to your crop."

**Perennial persistence**. Managing perennial wild plants within an agricultural system may require more vigilance and effort from the farmer than annual species.

DiTomasso: "With annuals, yes, the seed bank is there. If you don't let them go to seed, you can drop down that seed bank. I'm a little more concerned when it comes to perennials because I've had to deal with them and they are not easy. It's very easy for the plant to get away. Perennials become a lot more problematic just because of their persistence and farmers are concerned.

Certainly, of greater concern are those species that reproduce vegetatively. Japanese knotweed is very aggressive and can grow through foundations. Now, having said that, it's very valuable to beekeepers. For [plants designated as invasives], I'm a little more sensitive to them because of how aggressive these plants are and how difficult it is to get rid of them. I could see a farmer who wants to grow knotweed, but you would have to be very careful to control the area, because you cannot kill this plant (non-chemically).

If farmers already have a population of knotweed and it's being managed, then there's no concern. But, if it's going to be transported elsewhere (if it's in a riparian area where the rhizomes can be transferred by water), I would say, instead of fighting it, why don't you use it, but keep an eye on it. If you harvest it, that will knock off the dormancy of lateral buds and the plant will tend to try to spread more."

*Dandelions in asparagus beds*

# RETHINKING WEEDS IN THE GARDEN AND ON THE FARM

BY KAREN WASHINGTON

*Karen Washington is a farmer and activist. She is Co-Owner/Farmer at Rise & Root Farm in Chester New York. As an activist and food advocate, in 2010, she co-founded Black Urban Growers (BUGS) an organization supporting growers in both urban and rural settings. In 2012 Ebony magazine voted her one of their 100 most influential African Americans in the country and in 2014 she was the recipient of the James Beard Leadership Award. Karen serves on the boards of the New York Botanical Gardens, Why Hunger, Just Food, and Farm School NYC.*

*Rise and Root is a cooperatively run farm in the black dirt region of Orange County, New York. Our farm team is made of strong women, teachers, leaders, students, and growers. We grow vegetables, flowers, and herbs using sustainable growing techniques - we never use chemical pesticides or herbicides on our farm. Instead, we focus on building up a healthy ecosystem and restoring balance to the land.*

Last year was our first season farming in the black dirt of Orange County, NY. We had heard that you can grow great vegetables in this unique soil that has over 40% organic matter. Tales have been told that this land was once a huge glacier, with fossilized bones of mastodons recently discovered in this region. As you dig into the soil with your hands or a spade, you can see, smell and feel its richness. The closest comparison might be fresh compost, which we call black gold. It is truly black dirt, getting into our clothes, hair, fingernails and skin.

As we began our first year of planting vegetables, herbs and flowers, to our delight the fertile black dirt helped us grow plants that were huge, massive and glorious… and so were the weeds. Average weeds that normally grow in the back yard, or cracks of a sidewalk, suddenly grew into Christmas trees. We were frustrated, to say the least, as we saw our crops being overtaken. So going into our second year, we decided to take a different approach to assessing weeds.

Weeds - are they friend or foe? Well that depends. Some weeds are edible. In fact most of our restaurant clients love our weeds. Who knew that all this time, we have been throwing away money! But seriously, I have started to look at weeds with a little more compassion. Besides being able to grow like monsters in the black dirt, there has to be a reason why they are there.

So, I started to dig in. The earth does not like to be barren. Bare soil is like a person who has lost their hair wishing that they had some protection against the blazing hot sun, strong winds, or deluge of rain. Weeds are nature's way of protecting the land from soil erosion, dryness and sunburn.

Weeds can also tell us something about the condition of the soil. For example, purslane (Portulaca oleracea) can be a sign that the soil is high in phosphorous. It germinates in high temperatures, which is why we see so much of it in June and July. Some purslane seeds have been known to stay viable for more than 40 years. So do I say cha-ching or cursed?!

Let's move on to the next edible weed - dandelions. I can recall as a child blowing the heads of dandelions, making a wish for more play and less school, blissfully unaware that I was spreading dandelion seeds that would come back to haunt me as an adult. But dandelion is full of vitamin A, B, C, and D, and its roots have been used

to treat liver, kidney and skin problems. The leaves are edible and commonly used in salads, and this year at the farm we're using the flowers to make our first batch of dandelion wine!

Next up are lamb's quarters, also known as pigweed, goosefoot and even poor man's spinach. I ate some for the first time last year and was astounded by its flavor, similar to buttery spinach. Despite the taste, it quickly became my archenemy as it grew from those delectable little leaves to humongous 4-foot trees with roots that needed two people to pull out. Lamb's quarters are still commonly used as food in other parts of the world, and they were once a green vegetable of choice in the U.S., packing a wallop of vitamins and minerals. A note of caution about lamb's quarters - it does contain oxalic acid, which can interfere with the body's absorption of iron and calcium. So eat up and be healthy; just don't splurge.

As we continue to grow our produce and flowers, I will get better acquainted with our other arch rivals such as crabgrass, bindweed, morning glory and chicory.

In conclusion, as they say, "if you can't beat em, eat em". I think on our farm we would need the whole town of Chester to do that. However, at Rise & Root Farm we have come up with our own solution. Once a month we encourage volunteers to take part in what we call "weed aerobics". If you can't "beat 'em"or "eat 'em" at least you can get in shape "pulling 'em".

So the next time you see a weed, think twice about whether to consider it a friend, foe, or part of your next fitness craze.

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# PART TWO

# EDIBLE WEEDS ON FARMS

# GIFTS OF EDIBLE WEEDS

Aside from nourishing the farmed landscape, the weeds which are the focus of this guide also provide direct nourishment to farmers and their customers. Numerous farmers across North America include edible weeds on their market lists. Some have been peddling them for decades, turning a deaf ear to judging comments from other farmers. Others have turned to the weeds more recently, their curiosity piqued by the growing market wave.

120 farmers from across the Northeast with experience harvesting edible weeds participated in a survey as part of the data collection for this guide. Participants unanimously responded that they are interested in continuing to bring edible weeds to market. Of course, wild crops are not without their challenges and the united "yes to weeds!" was accompanied by a few caveats. Part Two of this book describes the complexities and rewards of edible weeds as supplemental market crops.

Along with the regional survey, much of the information about farmers' experiences with weeds as crops was gathered through interviews with farmers whose farms have an established practice of weedy harvests. Their stories are sown throughout this section to provide guiding advice for aspiring farmer-foragers.

## MEET THE FARMERS:

### Mark Kimball: Essex Farm

Champlain Valley - New York. Founded: 2003

**Wild crops include**: stinging nettles, field sorrel, dandelions, garlic mustard, Japanese knotweed, wild grapes.

**In their own words:** Essex Farm is a 1,100 acre sustainable, diversified farm, offering a full diet, year-round CSA Membership with weekly on farm pick up and direct door-to-door delivery. Healthy, transformative food, hand picked and prepared with care. Essex Farm strives to produce an abundance of high quality products for our CSA members while fostering the health and resiliency of the farm, the farmers, the members, and the community. Our desire is to build an agro-ecosystem that is sustainable economically, environmentally, and socially. We work to make a farm that is better tomorrow than it is today. "Healthy soil, healthy plants, healthy animals, healthy people, healthy planet."

### Taylor Tribble: Red Oak Farm

Upper Hudson Valley - New York. Founded: 2005

**Wild crops include**: burdock, dandelion, lamb's quarters, amaranth, purslane, stinging nettles, berries, mushrooms

**In their words:** We are located on 85 acres of open pasture, cultivated cropland and woodlands, 60 acres of which is under an agricultural conservation easement. We currently manage about 12 acres planted in vegetables, berries, apples, herbs and open pasture for our heritage-breed laying hens. Our farm specializes in greens, fruit, storage and late/early season crops, as well as both culinary and medicinal herbs. We distribute our farm products through our CSA program, local farmers' markets, wholesale outlets, and special orders. We also offer a selection of herbal teas, dried herbs and other herbal products.

### Faith Gilbert: Letterbox Farm

Upper Hudson Valley - New York. Founded: 2014

**Wild crops include:** field sorrel, dandelions, garlic mustard, purslane, sumac, autumn olives

**In their words:** Letterbox is a collectively owned and operated diversified organic farm in the heart of New York's Hudson Valley. We raise special vegetables, herbs, flowers, pork, chicken, eggs, and rabbit using best practices in animal welfare and organic management. We distribute our goods through four farmers markets, a fleet of local restaurants, and our full-diet Hudson Valley CSA. We tend 64 acres of fields, woods, ravines, and mountainside, just outside

downtown Hudson. Outside the work day, we undertake research, serve as farm consultants and take on community organizing projects that benefit the agricultural community and our local economy. We also host farm dinners, weddings and other events that celebrate seasonality and place.

**Lindsay Napolitano: Fields Without Fences**

Delaware River Watershed - New Jersey. Founded: 2012

**Wild crops include:** stinging nettles, field sorrel, chickweed, dandelions, garlic mustard, autumn olives, and many more.

*Fields Without Fences polyculture planting featuring cultivated and wild crops*

**In their own words:** On our farm, located within the Delaware River watershed, we cultivate fruits, nuts, medicinal herbs, and wild edibles within naturalized plantings that mimic the wild ecology. Through site specific design, we integrate approaches found in environmental restoration, permaculture design, and regenerative agriculture to create low input, self-renewing, agroecological systems that naturally restore health and integrity to our shared landscape.Beyond our fields, we bring these practices to our consulting and design work with farmers, landowners, and organizations. Inspired by a philosophy that recognizes all elements are integral to an interconnected planet, we approach landscapes as interdependent ecosystems, out of which the well being of all is reflected in the health and functionality of the whole. We bring this mindful holistic approach to everything we do, from the products we craft, to the programs and services we offer.

**Nicole Starosielski: RambleBramble Farm**

Catskill Mountains - New York.

**Wild crops include:** dandelions, field sorrel, sumac, amaranth

**In their words:** We are a diversified, sustainable and organic egg and vegetable farm in western Catskill mountains. Our food comes straight form the earth without any genetic or chemical interventions: we don't use synthetic pesticides, herbicides, or fertilizers of any kind. RambleBramble Farm is located in the northwest Catskill Mountains on the west branch of the Delaware River. We are a diversified, sustainable and organic egg and vegetable farm. Our produce and eggs are available in our farm stand in the summer. We deliver weekly to New York City. We also offer eggs and select vegetables for wholesale buyers. Our food comes straight from the earth, without any genetic or chemical interventions: we don’t use synthetic pesticides, herbicides, or fertilizers of any kind, even those approved under organic certification. RambleBramble Farm is committed to food accessibility and food justice. We support our local food pantry, community garden projects, and affordable pricing for lower-income community members.

**Jordan Schmidt: Remedy Farm.**

Upper Hudson Valley - New York. Founded: 2014

**Wild crops offered**: dandelions, stinging nettles

**In their words:** Jordan Schmidt is a Nutritional Therapy Practitioner, Instructor for the Nutritional Therapy Association, movement teacher, and a farmer in the Hudson Valley, New York. She has spent a decade working with organic farm systems and is fascinated by the connections between the health of our broader environment and the health of our internal bodies. She is passionate about supporting and restoring wellness in the face of a world and healthcare system that often make it difficult. When she's not working with clients or instructing for the NTA, Jordan moonlights in growing herbs, foraging food, and geeking out about pasture on the grassfed dairy - Chaseholm Farm - she runs with her partner.

**Matthew Potteiger: Salt City Harvest Farm**

Kirkville - Central New York. Founded: 2015

**Wild crops offered**: lamb's quarters, purslane, amaranth, berries

**In their words:** This urban-edge, 34-acre farm serves as bridge for New Americans as they adjust to their new surroundings, language, and culture. The Salt City Harvest farm provides weekly transportation and land on which New Americans grow and harvest food for their families. The cultivation of culturally-appropriate foods helps New Americans maintain their cultural identity and heritage in an unfamiliar environment. New Americans share farming knowledge while forming cross-cultural friendships, practicing language skills, and collaboratively working the land. In 2018, Salt City Harvest Farm is proud to be running a community farm, incubator farm, apple orchard and vineyard. Community members and volunteers help out within all parts of this ecosystem which provides a wide range of agricultural skills specific to the Northeast United States.

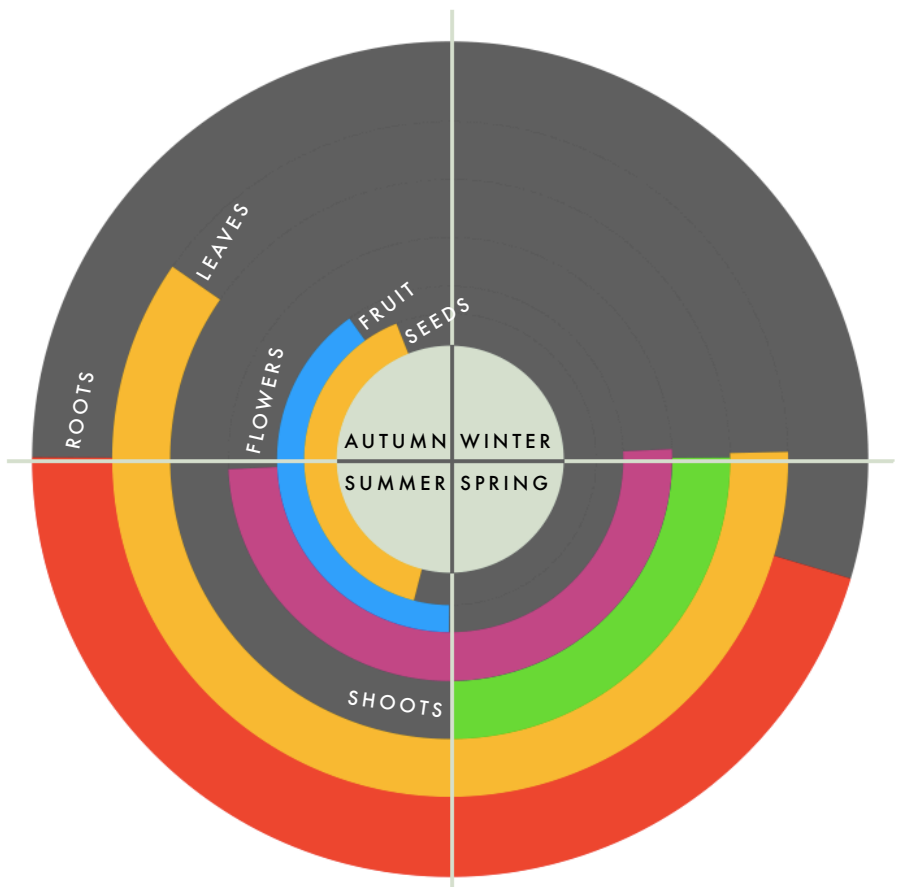
**Blake Arrowwood: Arrowwood Farm-Brewery**

Rondout Valley - New York. Founded: 2013

**Wild crops include**: dandelions, sumac, juniper

**In their words:** The Arrowood Philosophy is that great beer starts from the ground up. Using pristine water from Rosendale's historic limestone caves and rich New York terroir, we cultivate our very own hops and grain with love and care. Raising ducks, chickens, bees and pigs is just as important to us and we believe that all the critters we care for play an important role in the farm's ecosystem. Powered entirely by our own solar panels, it is safe to say that every sip of beer contains more than a drop of sunshine too! [Farm offerings include: hops, grains, honey, herbs, fruit.]

HARVESTING CONSIDERATIONS BY SEASON:




*Seasonal overview of prime harvest periods for wild produce by edible part.*

**Avery McGuire and Edward Blain: Thalli Foods**

Finger Lakes Region - New York. Founded: 2017

**Wild offerings**: a diversity of seasonal wild foods. McGuire and Blain are full-time foragers.

**In their words:** We are Edward and Avery, the husband and wife team behind Thalli Foods. We gather, eat, and preserve wild foods. We love to share what we know and are on a constant quest to learn more about what we don't know. We both began professionally foraging in the UK, Edward in 2011, Avery in 2014. We worked for Miles Irving at Forager Ltd, Britain's leading supplier of Wild Food. There, we were harvesting over 200 species of wild plants for

restaurants in England, Scotland and Wales. In 2017 we moved to Avery's hometown of Ithaca, NY where we set up our own wild food supply business. After two years exploring the Finger Lakes Region and all its bounty, we made the move back across the Atlantic, to the West Coast of Ireland.

We work with farmers, landowners, schools, and the public to educate them on how and where to find wild foods, how to prepare and eat them, and how they can be commercialized in a way which benefits the environment, and society. We offer consultations for domestic and commercial land use with regard to edible wild plants. We supply wild foods to anyone who wants them - restaurants, our friends, the public, wholesalers and distributors - because we believe in that. There is a great need for sufficient nutrition and easy availability of it. In our bodies and on our landscapes.

We believe in biodiversity. Our aim is to increase the diversity of the human diet while also improving environmental diversity. It's true that plants, mushrooms, lichens, algae and other organisms growing wild are commonly found to be higher in nutrients than cultivated foods or found to contain unique compounds not found in other foods. Due to the great diversity of species, they collectively offer an exceptionally broad spectrum of nutrients, aka flavors. Diversity is delicious.

Our work is research into wild foods as a future resource for food on our planet. We record every move we make, every plant we harvest and every change in the populations we collect from. This is something we learned from Miles Irving at Forager. We are creating a sustainable example for future generations.

## GIFTS OF EDIBLE WEEDS AS MARKET CROPS

A few reasons to add edible weeds to your market table:

**Edible weeds gift diversity.** Arguably the greatest contribution weeds give to a farm are their wild bodies. Edible weeds do not mimic bred crops in obedience, uniformity, or schedule. Instead, they adhere to circumstance. In their quick annual life cycles and self-sowing ways, edible weeds readily adapt to changes in soil, water, and climactic conditions. In a world where climate is becoming ever less predictable, to befriend an edible weed is to learn from an expert in living with uncertainty. From the practical standpoint of building a resilient business, the more diversity a farm fosters, the greater its strength and ability to withstand extreme weather and significant influxes of insects or pathogens (biological invasions). Adding crop diversity of any kind is, in that very act, risk abatement - but in adding weeds as marketable crops, the risk is reduced even further because the crops being added are experts in surviving through unforeseen hardships.

Mark Kimball: "We are trying to put more diversity into our CSA shares and we look out and the compost pile is covered in 4 inch lamb's quarters. I don't think we have a choice. For the most part, in areas that were disturbed, those greens come up and taste good, are easy to harvest, easier to harvest than something else, usually more nutritionally dense, usually better for you. We are just under $1 million in sales and wild edibles are 1% or less of our offerings in a given year by calories or nutrition. There is nothing conscious about it [offering wild edibles] besides opportunistic. There is appreciation. It's part of our conversation in trying to find individual and community health and then take on challenges with bravery and fearlessness. Wild foods are probably one of the touchstones of our diet."

**Edible weeds provide first.** Edible weeds fall into two broad categories: annual self-sowing volunteers or vegetatively-spreading perennials. One competitive establishment strategy often utilized by plants in both categories is to leaf out earlier in the growing season than most other neighboring plants in order to get a head-start on photosynthesizing and expanding their populations. Many annual weeds are hardier and less affected by drastic temperature swings of spring and autumn than their cultivated counterparts. Many

edge-dwelling perennial weeds take advantage of extra days or weeks of direct sunlight before the rest of the forest canopy unfurls in order to photosynthesize their way into a sunnier locale. This strategy means that weeds as market crops also fill an important lean season harvest niche. In early spring, before most cultivated crops are ready to be picked - and when customers are hungriest for the first, fresh greens after a long winter - weedy edible greens are at their lushest harvestable stage. Many farmers who sell edible weeds cite this bridging of the shoulder-season gap as the most valuable economic service weeds provide to them.

Nicole Starosielski: "Selling weeds wasn't a part of the original plan. The idea first came up in the early season when not much is growing except for many weeds. They can help fill in the gaps in the small scale markets; they supplement our CSA or farm market in early season. We haven't done much early season hoop growing, so wild greens have helped us provide more diversity in what we've offered."

*Stinging nettles and field sorrel*

**Edible weeds love community.** The weeds that offer food and medicine on farms have been providing these services since time immemorial. Many edible weeds commonly found today were brought from other parts of the world exactly because of the nourishment they offered to humans. By learning their stories and offering them at market, a farmer creates fertile ground for customer diversity as well. Edible weeds are anthropogenic to the core: they have been following gardeners around the world for generations. And many weeds, similarly to cultivated greens, are encouraged to grow more vigorously after being cut back for a harvest. By valuing edible weeds as crops, a farmer is also inevitably valuing cultural food stories, and building community around these ancient foods.

Matt Potteiger: "For the Somali and Bhutanese refugee farmers, it's kind of a joke reciting all the different names they know for pigweed and lamb's quarters. There is often a lot of laughter. They've emphasize that the lamb's quarters is really valuable where they come from, so they really appreciate getting it essentially for free. From the very beginning, there has been a built in structure for dividing the harvest equally among the farmers."

**Edible weeds are free.** One of the pleasures of foraging is that, unlike most other transactions for food, gathering wild food requires no wallet and can thus provide a brief respite from capitalism. To a farmer harvesting edible weeds for market, this is only partially true, but truer than for any other category of crops. Edible weeds have nearly no overhead. There are no seed, soil amendment, tractor fuel, or irrigation costs. Between weeds in a field and weeds at market lies only the labor cost of harvesting and processing. To Bob Cannard of Green String Farm, weeds are not only free, but actually pay the farm. Not only do they provide marketable crops, they are in fact the number one crop because "they are the plants that will allow the next cycle of crops to grow," while "the vegetables are a secondary response of having good soil and a good digestive system."

Faith Gilbert: "Because there is no labor involved in planting, cultivating, etc, it's really just the labor cost, it always lines up. We never pay ourselves more per hour than we do harvesting ten quarts of purslane in an hour. It makes up for the two failed beds of carrots that didn't germinate."

**Edible weeds increase dollars-per-acre.** Not only are spontaneous crops free to produce, they also augment what one stretch of soil can contribute to a

farmer's livelihood. Harvesting edible weeds from between and around row crops can make any vegetable bed more economically productive, while simultaneously strengthening the soil. Plus, more intense food yields from a consolidated section of field can help relieve other areas from agricultural production and free up more land as habitat for non-human beings.

Taylor Tribble: "I plan for some wild crops to succeed cultivated crops. Say, a spinach bed gets harvested, then mowed right as lamb's quarters or amaranth are coming up. We then get a second crop of that wild thing."

**Edible weeds are efficient.** As much as a farmer may want to linger and relax in the field on a sunny June afternoon, efficiency is essential for getting through the daily list of summer chores. As weeding is often at the top of the to-do list and contributes the largest portion to labor costs on most farms, harvesting edible weeds for market ameliorates the cost of labor. Unfortunately, weeding and harvesting simultaneously does not contribute efficiency to either task and remains in the realm of fantasy farming in a perfect world.

**Edible weeds are in growing demand.** Many of the common weeds farmers battle hardest are the very ones popping up on restaurant menus, at farmers' markets, on book shelves and pages of national media. For close to two decades, the popularity of foraging has been rising from both ends of the socio-economic spectrum. For thousands of years, many have turned to gathering wild food in times of war, natural disasters, and other sudden resource losses. Foraging has a long history of supporting low-income or food insecure communities across the planet. As the wealth gap continues to carve a deeper canyon across North America, more people have, yet again, turned to gathering wild foods to supplement nutrition and calories. According to studies of recent foraging trends in the United States, the practice is thriving - across urban centers, among a generation whose professional paths were shaped by the 2008 recession, in new American communities and many other groups - and includes many who have taken up this practice within the past five years.

On the other side of the income canyon, gathering and consuming wild foods is also attracting a growing number who fall into higher end income brackets. Chefs working in the fine dining industry are promoting wild, often weedy, ingredients as the ultimate in terroir experiences and beyond-organic sustainable eating. Chef Rene Redzepi has, perhaps, received the most media accolades for his use of so-called weeds. His restaurant, Noma (Copenhagen, Denmark), is famous for relying on locally-sourced wild ingredients and for being voted best restaurant in the world four times. Redzepi's promotion of edible weeds has sparked many other high-end culinary establishments to incorporate wild foods into their menus or to highlight them to the customers. Some chefs are also utilizing edible weeds to retell important cultural stories. Sean Sherman, Oglala Lakota, founder of The Sioux Chef, a food company committed to revitalizing Native American cuisine, uses so-called weeds, among other food plants, as vehicles in reclaiming and sharing indigenous culinary cultures.

While motivations for foraging are as diverse and numerous as the foragers themselves, many people clearly hunger for a weedy course.

Sean Sherman: We took the time to not call everything a weed if we didn't know what it was, but to take the time to learn the name of it and its true nature and what we can do with it. And looking at past cultures and how they utilized things, because the wild plants around us, for indigenous communities, were food and all the medicine and everything. People were extremely knowledgeable. So we utilize a lot of that nature —still recovering and understanding a lot of that knowledge to utilize for the foods that we do. We make things like cedar maple tea, or we'll utilize cattails, or even non-indigenous species like dandelions and burdock —they're still food. We look at those plants through an indigenous perspective and see they have use."Rootstock Radio, July 2017 https://beta.prx.org/stories/210475

CHAPTER FIVE

# GATHERING WEEDS

There was once a time when each of us could not recognize the plants we now unequivocally know as food. Then we learned, one plant at a time. Learning to recognize new wild edible plants is no different. Samuel Thayer, a renowned foraging teacher, compares the learning process to the task of differentiating a cabbage from head lettuce. If going solely by written descriptions, the two green, spherical, leafy vegetables may seem nearly identical. But, to anyone who has experience with them, whether in the kitchen or garden, distinguishing one from the other is a cinch.

Learning a new food plant is, ideally, a slow process. It's essential to be fully confident in identification and to know the plant's life cycle to ensure responsible harvests. Moving from harvest for yourself to sharing the food with others is also a big responsibility. To be a good guide in this learning process, take that part slowly too. Get to know each plant using more than one sense: learn its textures, smells, tastes, and favorite cooking preparations before bringing it to market.

To be a good forager, one must not only know where to find and how to identify edible plants, but also how to gather them safely, responsibly, and with respect for yourself, the plant, your shared ecosystem.

## GATHERING EDIBLE WEEDS

Similar rules apply to harvesting edible weeds as to gathering cultivated crops. Perhaps the main challenge of harvesting weeds is that of perspective: when they are gathered for market, weeds lose their identity as weeds and should be treated on par with crops sown in rows. As with all other crops, weedy harvests should be timed to maximize nutrition and flavor and minimize damage from processing and storage.

The primary difference between wild and sown harvests is a consideration of future plant generations. When annual crops are reaped, the intention is usually to re-sow them at the next available opportunity. When annual weeds are gathered, however, it's important to know whether your stewardship goals include decreasing the overall seed bank or ensuring regeneration of the wild plant beneath your harvest knife.

**Learning to identify and use wild edible plants:**

Whenever possible, start by learning from someone who knows, lives with, and eats the plants in question. Seek out local foragers who host classes or are open to sharing their knowledge one-on-one. Use foraging guides as secondary sources to learn more, be wary of identifying new edible plants from books alone. The Internet is a wealth of great, bad, and untrue information about foraging. Seek reputable and multiple sources. Instructional videos, of which there is an extensive free library online, can be particularly helpful in showing plants in detail and within their growing habitat.

**When gathering any plants for food, following three general ground rules will ensure safe, delicious, and responsible harvests:**

### 1. IDENTIFICATION

Confident identification of food plants could, in a few extreme cases, be the difference between life and death. This is as true for plants that grow themselves as it is for those sown by human hands. The majority of the planet's plants are edible for humans - so more often, misidentification is the difference between a delicious meal and a bitter bite. Always be 100% sure what you are harvesting. Ideally, follow a new plant through all seasonal cycles before harvesting.

### 2. LOCATION

When seeds are carefully sown, the grower usually knows something about the history of the soil they are planting in. When wild plants are found, it may be the first time a harvester lays eyes on that particular patch of ground. There are no hard and fast rules for knowing whether you are harvesting from a clean

location except to start by asking: is this a place I would eat from? If the answer is no, forget the harvest and ask instead what you can do to bring health back to this place.

Unlike land-less foragers who may worry about discerning whether a potential harvest area has been chemically treated, farmers who are the primary and often only human tenders of the same land year after year may have more information and different questions about the location.

Safety considerations relevant on private farmland:

**Pesticide/herbicide drift.** Since farms are often clustered near one another, a neighbor's growing practices can have reverberating impacts on both growing spaces. When foraging near a neighbor's field, be aware of their amendment practices, as some chemical applications are airborne and do not obey trespassing laws.

**Right-of-ways.** Another area within a farm where chemical applications may be out of a farmer's control are right-of-ways, such as power line cuts or train tracks, that are managed by others. For peace of mind, consider requesting to see a management plan from the company or government organization in charge. If this is not an option, look to the plants for signs. Is there a line of dead or dying plants, while similar species nearby remain green? If so, chances are that herbicide was recently applied. Is the landscape looking overgrown, unruly, and green? Chances are, it's free of chemical applications. Certain perennials categorized as "invasive" (such as autumn olives and Japanese knotweed) are sometimes targeted for spraying. Be sure to look for signs of chemical use among stands of such species.

**Salt drift and other road goo.** For reasons described above, roadsides can also be risky strips for foraging. If the farm has a no-grow zone between a well-used road and tended fields, make sure the area is a no-forage zone as well.

**Old orchards.** Through the 1900s, many orchards were treated with lead and arsenic; the heavy metals persist in the soil. Wild vegetables, especially low-growing herbaceous greens, from such settings could be contaminated.

**(Re)generation considerations:** The majority of the wild plants featured in this guide either have rapid annual life cycles with prolific seed production or are perennials that readily reproduce vegetatively. Most plants that thrive in disturbed soils or field margins are adapted for quick growth and frequent harvests. In other words, in most scenarios, it would take years of repeated and extensive harvests to make a negative dent in the plant's local population. However, many other plants considered delectable by people have slow reproductive cycles and specialized habitat requirements. Harvesting them - especially on a commercial scale - can quickly and significantly impact populations. Ramps, aka wild leeks (*Allium tricoccum*), are a prime (and by now, infamous) example of a species whose commercial popularity is mismatched with the plant's life cycle. A single plant can take over five years to reach reproductive maturity; its seed may then take up to one and a half years to germinate. Ramps are only found in the forest understory, under particular tree species, in humus-rich soils with ample moisture and summer shade.

On the other side of the spectrum are species often categorized as "invasive." Plants that fall into this category are naturalized well outside of their traditional distribution range and grow so prolifically that they may overtake habitat once used by native plants. In this case, harvesting invasive plants frequently and abundantly has the potential to positively impact the balance of species in an ecosystem.

If farmers want to ensure a sustainable relationship with the land they steward, they must understand the life cycles of any wild plant they consider harvesting. Refer to Part Three of the guide for more on the life cycles of individual species.

**Animal activity.** Of course, wild food plants do not grow in isolation from wild animals. However, on a farm where the density of animals may be much higher than in a balanced ecosystem, foraging for

edible plants should happen outside the manure zone.

## 3. ETHICAL PROTOCOL

Just because a plant is seen as a weed by some does not mean it does not deserve to be respected. A weed is as much a living being as all other plants. To interact with a weed not only impacts the individual plant, but has reverberating effects on other beings who inhabit the same ecosystem. To be a responsible member of the ecosystem, be sure to approach all harvests mindfully. Practice respect for yourself, for the plants you are taking from, and for those with whom you share your harvests. Ethical protocols of engaging with the land take many forms and are, of course, deeply personal decisions. One guideline for ethical engagements with plants is the Honorable Harvest, which is a set of teachings shared by many Indigenous cultures. It is offered here as a guiding direction when thinking through your own principles of reciprocal, responsible, respectful harvests.

### The Honorable Harvest

By Dr. Robin Wall Kimmerer, member of the Citizen Potawatomi Nation, author of *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants.*

If I could choose just a single element of the traditional teachings that we are called to pick up, it would be the teachings of the Honorable Harvest, which were taught us by the plants, who give us everything that we need. It's a covenant of reciprocity between humans and the living world, a very sophisticated, ethical protocol. One of the first steps of the Honorable Harvest is to understand that the lives that we are taking are the lives of generous beings, of sovereign beings. In order to accept their gift, we owe them, at least, our attention. To care for them we must know what they need and, at the very minimum, we should know their names. And yet, the average American can name over 100 corporate logos and only ten plants. Is it a surprise that we have accepted a political system that grants personhood to corporations and no status at all for wild rice and redwoods?

The protocols for the Honorable Harvest are not really written down, but if they were, it would look something like this:

When you get to the woods, you don't just start grabbing everything in sight. We are taught never to take the first plant that you see and that means you will never take the last. This is a prescription with inherent conservation value. If we encounter another plant, we ask permission. I've always been taught to address that plant, introduce myself and tell it what it is that I have come for. If you are going to take a life, you have to be personally accountable for it. I know there are places where if you talk to a plant, they would think you were crazy but, in our way, it's just good manners.

If you were going to ask, you have to listen for the answer. You can listen in different ways: pragmatically, intuitively, look around and see if those plants have enough to share. If the answer is no, you go home. For we remember they don't belong to us and taking without permission is also known as stealing.

The Honorable Harvest councils that we also take in such a way that does the least harm and in a way that benefits the growth of that plant. Use everything that you take; it is disrespectful of the life that's given to waste it.

The next tenant of the Honorable Harvest is to share it with others, human and non. The Earth has shared generously with us, so we have to model that behavior in return. A culture of sharing, we know, is a culture of resilience.

Plant gatherers often leave a spiritual gift behind but it can also be a material gift: weeding, care-taking, spreading seeds, helping those plants to flourish. We give songs. We give ceremony. We give our respect. We give fertilizer.

Every breath that you take is a breath that was made for you by plants. The water that you drink, whether you are in an urban setting, whether you are on a remote mountaintop - we still are recipients of those gifts. If we take the time to be grateful, that brings us into that state of humility, of understanding that we are not at the top of a biological hierarchy, that, in fact, we are the younger brothers of creation.

— Robin Wall Kimmerer

## WHEN TO HARVEST EDIBLE WEEDS

Another way to begin attuning to the seasonal harvest cycle of edible wild plants is to consider what part the plant is sending most energy into in a given moment. This is often the most nutritious and flavorful part to harvest. For example, when dandelions are in bloom, it's an ideal time to gather their flowers; however, at this time their leaves will be tougher and drier than before flowering. In late fall, after the leaves have senesced, the plant's energy is concentrated in the root; it's then a perfect time to dig.

**Roots.** Some wild roots grow very deep; choose a digging site with the softest soils. On a farm this area is often alongside row crops or in other areas where soil is often tilled. Wild roots such as burdock (*Arctium minus*) can grow four feet down. Consider leaving the tip in the ground if it does not readily pull free. The top of wild roots can often be fibrous and unpalatable. Taste test to confirm quality. Roots are most tender after the first autumn frost and before the last spring frost.

**Greens/Leaves**. Pick greens young. Most plants harvested for their leaves taste best before their stems turn fibrous or woody and prior to flowering and setting seed. If the main stem of the plant snaps easily, chances are the plant is tender enough to harvest and prepare whole. Once the stems only flex or break under pressure but before the plant has flowered, the leaves alone remain delicious and tender and can be picked off the stem. This state of palatability is similar to that of lettuce, spinach, arugula, and other crops which are best picked before bolting.

**Shoots.** Wild shoot vegetables are an ephemeral spring delicacy, just like their cultivated counterparts such as asparagus. As with asparagus, they are only harvested when stems snap with a sharp pop. Japanese knotweed is a prime example: at first, shoots snap at surface level, but as spring progresses, the base becomes woody and the shoot remains snap-able only higher up the stem. And similar to asparagus, repeated harvests encourage new shoot growth. Other wild vegetables, such as wild mustards, have a stem-shoot harvest opportunity right before the plant flowers. This kind of harvest is comparable to that of broccoli rabe.

**Flowers.** Wild flowers, just like their cultivated counterparts, are sensitive. Most have a long shelf life if they stay consistently cool and dry. Time the harvest for after morning dew has evaporated but before the day's heat sets in. Remember, the quantity of flowers harvested may have a significant impact on plant regeneration.

**Fruit and berries.** Wild fruits are harvested using nearly identical methods to those applied to cultivated varieties, with one key difference: the taste and texture of the fruit can swing broadly from plant to plant. Taste test to choose which individual plants to harvest from.

**Seeds.** The main consideration with seed harvests is moisture content. Mature seeds that appear dry on the outside may still hold moisture inside the seed. Dry thoroughly and then dry some more. Additionally, if harvesting particularly weedy seeds, be mindful of where they may fall along the way and where you compost the chaff.

## SEASONAL HARVEST FLOWS FOR COMMON EDIBLE WEEDS ON NORTHEAST FARMS

| species: | early spring: | mid spring: | late spring | early summer | late summer: | early fall: | late fall: |
|---|---|---|---|---|---|---|---|
| **autumn olives** | | | | | fruit | fruit | |
| **burdock** | roots | roots | | | | | roots |
| **chickweed** | whole plants | whole plants | whole plants | | | whole plants | |
| **dandelion** | flowers, leaves | leaves | | | leaves | leaves | roots |
| **field onions** | whole | tops | flowers, bulbs | bulbs | bulbs | | tops |
| **grapes** | | | | | fruit | fruit | |
| **japanese knotweed** | shoots | shoots | | | | | |
| **lamb's quarters** | | whole plants | whole plants | leaves only | leaves only | leaves only | |
| **locust** | | | flowers only | | | | |
| **mallow** | | whole plants | leaves and flowers | leaves and flowers | leaves and flowers | leaves and flowers | |
| **nettles** | whole plants | whole plants | leaves only | leaves only | | whole plants | whole plants |
| **pineapple weed** | | | whole plants | whole plants | whole plants | | |
| **purslane** | | | | whole stems | whole stems | | |
| **sumac** | | | whole plants | whole plants | | | |
| **wild mustards** | | | | | | | |
| **wine berry** | | | | | fruit | | |
| **wood sorrel** | | whole plants | whole plants | whole plants or leaves and flowers only | | whole plants | |

*Wild mustard flowers harvested as garnish*

# GARDEN PESTS AND WEEDS: BOB CANNARD'S UNIQUE TAKE

BY BOB CANNARD

*Bob Cannard, a master farmer who developed his own innovative ecological farming practices, has always been ahead of the curve. More than 25 years ago, he was a lonely voice extolling the importance of carbon in farming when everyone else was emphasizing nitrogen. We know now that soil carbon can build fertility and mitigate climate change. He is also a pioneer in using practices that enhance soil biology.*

*Bob tends to make seemingly outrageous statements that later prove true. Several decades ago, he was suggesting that humans are really just an amalgamation of microbes. Recent research indicates that the ratio of microbial cells to human cells in the human body is at least 1:1 (and possibly much higher depending on the individual). Cannard, the activist, was the first to initiate a campaign for GMO labeling in California. His latest effort is a campaign to eliminate all pesticides from California agriculture by 2050. This is an excerpt from a past Bioneers Conference presentation.*

There is some acceptance of the term "pest." I just can't see that. When I go out to the garden, especially the garden of nature, I see no pests. I see high population levels of some organism that we've labeled as pests because they are massing on the fruits or the foods that we wish to consume. The presence of these organisms is a demonstration of weakness, not of the genetic makeup, but most likely the environmental support that the plant is getting.

**Weeds and Pests as Allies.** I don't look at those organisms as pests. They're really great friends. They're letting me know whether or not the environmental circumstances are sufficient to support that crop at that time. We look so little to the organism that we cultivate, even all the way up through the university research systems. I'd like us to actually look at the plant as if it were one of our children, know the plant, truly sensorially connect with the plant, listen to its speech, its speech of anchorage.

We go out into the garden to pull a weed and that weed doesn't want to get pulled. It is well bonded with its spot. It likes it there. It is there of its choice. We could learn something from that pestiferous plant organism, the weed. Why does it like it there?

**Plant Communication.** Plants that like it where they are have good anchorage. Plants that don't like it where they are don't have good anchorage. Plants that don't like it where they are and don't have good anchorage and which are then fed to get their needs met, increase in anchorage qualities and characteristics. Anchorage is one of the ways of speech of the plants.

Bugs are another form of speech. The plant population that is happy in its environmental structure doesn't have pestilence problems. Bugs and plants have grown up together beautifully during the life of this planet. If they truly had adversity between each other, one or the other would have won out a long time ago, and it probably would have been the bugs. But they can't do that because they have completely sympathetic activities. The bugs are the cleaners and the gleaners and the improvers of life; they're the bathers. They eat the old leaves on the lower level of the plant, which was once the present part of the plant, but has now become the past of the plant. The plant doesn't need it anymore, it has withdrawn the nutritional support from its past in order to put it into the present, into flowering, into the seed-bearing time of its life.

**Attitude of Adversity.** The observation of past and present and conceptualization of where that is leading is so important in growing a plant. If we want to grow plants that have energy and completeness and contentment and possibly etheric sweetness, we can't cultivate those plants with an attitude of adversity.

If we look at the garden and we think of all those hateful weeds and all of those horrid bugs and all of those pests, we carry an adversarial energy into the garden. That adversity is part of what we are likely to harvest. Instead of viewing bugs as pests and focusing our energies on getting rid of them, we can view bugs as a resource that we can utilize. If we strengthen the plant's resistance to bugs by improving the environment and providing nutritional support, we can harvest a more complete meal, one that digests nicely and has lots of energy – from the great diversity available in the environment – to share with us. We can start thinking like a cilantro or a carrot or a potato, any and all.

But our food is not grown that way. I really feel that it is because we don't look at plants. We hardly even address the issue, and to me, this is truly restorative. We've got to drop right down to the level of the creature that we are interacting with and very rarely do we do this.

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*Queen Anne's Lace - Wild Carrot - Daucus carota*

CHAPTER SIX

# WEEDING FOR MARKET

## MANAGING EDIBLE WEEDS IN THE FARMSCAPE

For a farm to sustainably coexist with weeds, there must be planning and some management of free-ranging plants. After all, weeds are often more resilient and persistent than domesticated vegetables and, if left untended, are likely take over areas reserved for sown crops. As Green String Farm's Bob Cannard puts it, "It's all about managing the population densities and controlling the time-space sharing. My biggest concern with weeds is managing the multiple inter-cropping systems. It is delicate. It is very site specific. But, at the same time, very important if you want to grow soil."

This chapter discusses how to maintain edible weedy crops symbiotically with the tending of cultivated vegetables.

Lindsay Napolitano: "Working with the wild is a complex endeavor. On one hand, she doesn't appreciate complete anonymity. When there's no hand there, no interaction, that isn't necessarily the best course for things. On the other side, there's an over application of the hand, whether that's in the form of altering environments, whether that's in the form of over harvesting, or even in the form of other environmental factors that contribute to why some plants are growing and some aren't. It has to be this careful dance where you are in relationship with the wild but are not exploiting that relationship, kind of like human to human interactions."

### PLANNING FOR WEEDS

Planning considerations for the incorporation of edible weeds as crops can be categorized into those relevant to in-season growth cycles of annual species, and those relevant to multi-year populations.

**Annual Growth Cycle.** Edible weeds do not follow seed-packet protocols. Their "days to maturity" are mainly determined by adapting to circumstance (which is also their key to success). This means that the best way to understand weeds as market crops is through patient relationship-building: taking ample time to observe their lives in the field.

Mark Kimball: "It's always about a day-to-day and week-to-week assessment of which field is where, what are we looking at and what do we want to do with it."

Most farmers consulted for this guide found that incorporating one or only a handful of wild foods into their market list each season was a pace that worked well for their growing plan. On the market end, adding one plant at a time minimized risks that go along with introducing a novel commercial offering, and enabled farmers to devote more time to helping customers get to know each new vegetable. On the field end, this pace gave the farmer sufficient time to learn when to expect each new wild vegetable within the particular micro-climate of their growing space and how each plant responds to varying biotic and abiotic fluctuations.

Faith Gilbert: We started with a bunch of things, then, came up with a couple of weeds that were consistently available. We learned their growth cycles and when to expect them. We could sell them and then figured out the best way to sell them. At this point, we can say: wood sorrel and purslane will be there year to year. We have a sense of their needed germination temperature. We know that purslane comes in in July and wood sorrel takes a hit in hot weather but is available in the spring and the fall. We also have it showing up in greenhouses, so it's somewhat weather protected there. We find little stands in the shade. So, we are able to have

wood sorrel available our whole wholesale season, which is about 30 weeks. Purslane we have for slightly shorter because it's more temperature sensitive.

For example, dandelions and stinging nettles have a robust growth spurt in early spring and are largely unfazed by dramatic temperature swings or late frosts. However, a transition into steadily warmer days shifts both species into a drier, fibrous, almost woody state and renders them less desirable as food. Another example is the timing of purslane's harvest relative to its susceptibility to leaf miners. The young purslane rosettes of early summer often look fresh and delectable up to the point of flowering, which tends to correspond to leaf miner feasting time. This closes the harvest window for purslane. Lamb's quarters, on the other hand, another green frequented by leaf miners, can be coaxed into additional cuttings after leaf miners move into their next life phase and largely abandon the leaves. If the plant is then cut two-thirds of the way down the stem, lamb's quarters will usually put on another flush of lush leaves before shifting attention to seed production. Chapter Five identifies the seasons in which growers can expect different edible parts of wild foods to be harvestable, along with a list of species that are tolerant of multiple cuttings. Aside from this general guidance, however, there is little advice applicable across all the conditional variations that influence how a plant behaves on an individual farm. There is no shortcut to learning how a plant lives year after year in a given habitat: the only trustworthy option is to live observantly and patiently by its side.

Lindsay Napolitano: "In general, I'm the one who brings plants into the system that I would like to see there. This is my crop list. Some of them are wild plants and some are plants that wouldn't necessarily be growing there that I need to cultivate. Something like fennel isn't going to spontaneously show up on our farm but it's the seed that I spread because it's the plant I want to see there. I bring everybody to the party but I don't get uptight about what happens after that. I have my ideas about who I want to see there.

The plants I want to see proliferate all go into their complete reproductive cycle, which means that at some point in the season, if it's an herbaceous plant, first cutting is a good culinary product, second cutting I find to be a good medicinal product, and third I'll usually let go to seed. As plants go to seed, their populations are spreading into areas. Some I anticipate, some are a surprise. I try to just observe happily where they are and then facilitate the continuation of that particular plot of plants.

**Composition.** If annual edible weeds are free-roaming, how can a farmer know where wild produce will show up in the field? Learning what species composition mosaics to expect on annually tilled soils is a more predictable undertaking than learning annual growth cycles. There are clues in seed dispersal mechanisms and in the soil seed bank. These clues will reveal patterns and eventually, a map of plant migrations will emerge.

The first big clue lies in the seed bank. Annual weeds are adapted to germinate in freshly turned soil and produce have seeds that remain dormant, often for years, until the right conditions occur. Species composition is bound to change with the years and will be sped up if external seed-containing elements - such as imported compost or seedlings grown elsewhere - are added to the field. However, keeping a record of what edible weed species germinate and where will give a grower foundational knowledge of what wild species could readily establish populations if allowed to mature.

It is helpful to recognize weeds at their seedling stage in order to balance planning for cultivated crops alongside edible weeds without adding the burden of hand-weeding on a large scale. If seedling identification is difficult, another option is to mark and leave a small patch of mystery seedlings as "witness weeds." These weeds will mature and ease the plant identification process. Additionally, if they are edible or otherwise of interest to the farmer, they can serve as witnesses in a tiny field experiment station, allowing the grower to observe how they interact with nearby cultivated crops, visiting

pollinators, herbivory pressures, etc. The term witness weeds is derived from forestry language: witness trees are long-living trees that mark old property boundaries or stood witness through impactful historical events and are often used to answer important questions about past ecological or social interactions.

**Migration.** The second big clue is in the seeds themselves. Most weedy annuals (and some perennials) create a prolific amount of seed each year as part of their reproductive strategy. How they then plant these seeds can provide information about where the plants will likely show up next year. Seeds that are relatively heavy fall near the parent plant. Seeds that are relatively light, and often outfitted with a tiny parachute-like (pappus) structure, are airborne and adapted to long-range travel and establishment far from their nuclear family.

Among the non-airborne seed set, some are dispersed away from their parents through various mechanisms (transport on the bottom of shoes and tires, through the digestive tracts of birds and mammals, in moving water, etc), but the majority tend to remain in place. Plants with these types of seeds can be counted on to show up near where the previous generation grew. The majority of edible weeds in discussion in this guide have seeds in this category, including amaranth, burdock, lamb's quarters, wild mustards, purslane, and wood sorrel.

**Cultivated-to-wild succession.** Taylor Tribble of Red Oak Farm uses information shared with him by wild seeds as an aid in crop management. Predicting where a patch of lamb's quarters and amaranth (which mature in early summer) will germinate based on where they dropped their seeds the year before, Tribble plans for some beds to go into cultivated-to-wild succession. He sows early season greens such as spinach or arugula on top of the areas where he expects edible summer weeds. He then harvests the cultivated crop and mows the row before or simultaneously with lamb's quarters or amaranth germination. He then harvests a second (wild) crop from the same growing space before tilling the bed under once again. In this way, Taylor receives two harvests for the effort of caring for one cultivated crop. He strategically leaves some patches of lamb's quarters and amaranth to go to seed, so that the cycle can renew the following year.

Those weeds in the airborne seed group go where the wind blows. Seeds in this category can show up anywhere, but are especially attracted to bare mineral soil; are often among the first to move to a freshly disturbed site and require light to germinate (in other words, they remain on the soil surface). On agricultural lands, plants in this category flourish in fields that are disturbed once per season or less. This rhythm gives such plants enough time to establish. For example, a sloping field that slows prevailing winds, freshly tilled for a perennial crop such as asparagus or rhubarb, is an ideal planting site for many wind-borne wild edibles. Edible weeds with wind dispersed seeds include dandelions, sheep sorrel, stinging nettles, common milkweed, yarrow, mugwort, and galinsoga.

**When the farm gives dandelions, make dandelion wine.** Jordan Schmidt's Remedy Farm primary grew perennial herbs and, alongside them, had established a very healthy population of dandelions. Although Schmidt's business already valued wild crops, the dandelions were so prolific that they impeded the growth of cultivated crops. One of Schmidt's management solutions was to harvest dandelion flowers (as well as some whole plants) in early spring - both as a supplemental crop at a time before sown crops were available and as a measure of balancing future dandelion seed spread across her fields. She gathered flowers over the course of a week at their peak, then sold them (frozen) to a dedicated buyer who pre-ordered the flowers for dandelion wine produced by a small winery (Enlightenment Wines - New York, NY).

*Remedy Farm during the dandelion harvest*

Photo: Jordan Schmidt

**A note on "invasive species."** A few wild edible plants featured in this guide are, in some states, categorized and regulated as invasive species. Invasion biology, the science of invasive species, is a complex field with a robust and growing body of critical literature that challenges its premises. For farmers interested in learning more about how ecological, cultural, and economic interests collide with respect to certain plant species and land management decisions, a dedicated bibliography at the back of this guide provides a starting place.

As invasive species management policies have wide-reaching ecological effects, a responsible land steward stands to benefit from being informed on these issues. In the context of harvesting wild edibles, keep in mind that certain harvest methods can encourage plant population growth. This can take place by spreading seeds or vegetative propagules via foot traffic in and out of a harvest area (for example, Japanese knotweed and wineberry) or by soil disturbance that opens up more prime habitat for an "invasive" species' to germinate (for example, garlic mustard).

Antonio DiTomasso: "If farmers already have a population of knotweed and it's being managed, then there's no concern. But, if it's going to be transported elsewhere (if it's in a riparian area where the rhizomes can be transferred by water), I would say, instead of fighting it, why don't you use it, but keep an eye on it. If you harvest it, that will knock off the dormancy of lateral buds and the plant will tend to try to spread more. It's almost like asparagus, in the sense that when you clip it for harvesting, you will get more. If you're going to control it and throw the stuff out, might as well get something for it. But, again, being vigilant to not spread it. You're certainly not going to kill it by a couple of clips that you're going to sell."

## WEEDING

Letterbox: Our weed control isn't amazingly on point. We don't weed our pathways all the time. There is usually a place on the farm that is behind on weeding for one reason or another, and if it includes purslane and wood sorrel, we are happy about that. As we get better and better at that, it is a consideration of: the cleaner we keep our crops, the less potential there is to sell purslane and wood sorrel. But, there is also a good amount of foraging potential in more marginal spaces on the farm. Ideally, in future years, we are more on point with preventative weeding. We will have less purslane and wood sorrel to sell and the revenue we generate from crops will even it out. But, if they are there, it's just a boon to us. If they are not there, i don't think we would plan our rotation to allow them to be there, but they seem to be resilient in trying to be somewhere on the farm.

Mark Kimball: "We spend our whole lives between May 15 and October 10 basically trying to mulch and annihilate or outcompete the edible and non-edible seed bank species. It's amazing how much we kill something that tastes delicious. We harvest one billionth of the [edible] ones that germinate and the rest we try to slaughter. There are times when I will use a somewhat heuristic methodology in weed control where if it feels like a fairly cold fall and looks like an imminent hard frost, I might let a bunch of weeds that are frost sensitive become a living cover crop. I would rather have a weed growing than nothing and as long as it doesn't go to seed, I'm very content with it becoming an unplanned green manure."

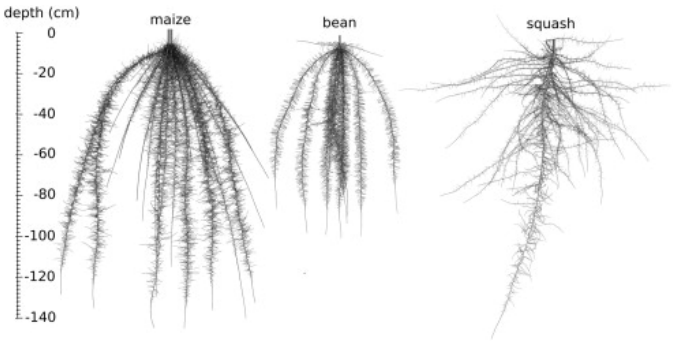
Coaxing seeds to grow into nourishing harvests in a tilled, annual row-crop production field, or any other system that consistently resets the successional clock back to a perfect habitat for ruderal species, will forever be entwined with the task of weeding. There may be as many opinions on managing weeds as there are farmers and as many nuances to consider as there are individual farms. Weeding is hard work, and adding edible weeds to the equation only adds more

time and energy. In some scenarios, edible weeds and cultivated crops can thrive side-by-side only if the farmer can learn to find comfort in a shaggier landscape, one that veers away from neatly cultivated patterns. In other cases, the challenges are not merely aesthetic, but substantive issues including competition between plants or transfer of pathogens and hungry insects from weed to sown crop.

In all cases, seeking balance and not war is the path to increased biodiversity, resilience, and happier farming. Learning how the land treats the plants that already grow there is an excellent starting point toward this balance. Considerations for co-managing agricultural systems with edible weeds include:

**Subterranean space sharing**. When the foliage of two plants grow close to one another, that does not always indicate competition for resources. Indeed, ancient polyculture technologies such as Three Sisters Agriculture, still used by indigenous peoples throughout North America to sustain human communities and healthy land, are one example. The squash is not in competition with the corn even though it carpets the soil surrounding the corn, the beans are not hindering the corn despite the fact that they use corn's tall stalk for support.

The symbiosis between these crops is easier to understand when looking below ground. Each plant




*cite: https://academic.oup.com/aob/article/114/8/1719/209154*

has a distinct root architecture that allows the three roots to occupy different layers of the soil, accessing different nutrients and mining neighboring sources of water, all while strengthening rhizosphere relations. This type of underground resource partitioning often occurs between cultivated and sown crops as well. For example, tomato plants may have a taproot, but rely most on a tangle of thin fibrous roots. Purslane often has a deeper taproot and more tuberous lateral roots. So when purslane moves in amid tomatoes, completely covering the bare ground between them, the picture underground may look very different. Thin tomato roots can reach between stout, tuberous purslane roots, while purslane's central taproot can mine a deeper soil strata and bring nutrients and water closer to the surface, giving tomato roots access to surplus nourishment. Touching above doesn't always mean touching below. Know your roots.

**Weeding out or weeding forward.** When it comes to spontaneous plants, edible or not, each land steward, farmer or not, has to decide what species they want to support in the landscape and which they would like to encourage to leave the area. It's a stewardship direction decision. With edible weeds, the farmer must decide if their goal is to eventually deplete the seed bank of a particular weedy species or, rather, to provide space for balanced, regenerative harvests of a particular valued weed. If the goal is harvesting the weed into local extinction, successive years of preventing the plant from going to seed and completing its reproductive cycle will eventually dwindle the population. If, on the other hand, the goal is to continue harvesting the weed indefinitely while keeping it from growing rampantly, weed strategically. Leave a patch to reseed in place, collect seeds and "move" the seed bank by re-sowing the plant in a more convenient location, or allow a few individuals throughout the growing space to complete their life cycle and incorporate their seeds back into the general seed bank when soil is next turned.

Nicole Starosielski: "We pull out as much dandelion as we can, but generally this is a weed that grows across our field and a pretty harmless one, all things considered. So, it doesn't have an effect on our plan. We don't harvest enough to make a dent in the field weeds."

**Marginal and forgotten spaces.** If conducting a feral symphony of weeds and sown plants within the same row sounds too stressful, consider other areas of the farm where soil is turned but crops aren't grown. These zones can be set aside for designated edible

weed harvests - or, conversely, weed harvests can be a surprise gift from zones that veer off the intended management plan. Overlooked areas prime for weedy harvests include:

- resting parts of a field not in cover crop
- edges of cover-cropped fields
- linear paths along wheelbarrow or tractor paths
- corners of hoop houses
- perimeters of compost area

Mark Kimball: "We will look around for a bunch of different cresses in a fallow field that didn't get cover cropped in the because it was too late for rye."

Matt Potteiger: "Last year, we wanted to give one field a rest so we let it go to weeds. That worked out okay, but there were more weeds than could be harvested."

Another possibility is to intentionally leave the last few feet of a tilled row unplanted as an easy, dedicated growing area for annual edible weeds.

**Weeding for desirable weeds.** Perhaps an even bigger psychological challenge for a traditionally trained produce farmer than allowing weeds to grow near sown crops is to weed a weed. If a grower has an established relationship with an edible weed to the point where they welcome the return of this species season after season, why not aid that plant in thriving? Selective weeding is certain to slow down a farmer's overall weeding efficiency but will, in turn, produce a bonus crop. Consider weeding in waves: first to select for lush edible weeds, second to thin the edible weeds for a second harvest, and third to clear out weeds entirely.

Nicole Starosielski: "We let the amaranth keep taking over parts of the field, weed intensively around it, try to control it, and try to find a better market for it."

**Mowing v. pulling.** The thought of letting weeds mature to a harvestable stage will, for some growers, immediately evoke a nightmare scenario of increased hand-weeding. For most growers, cultivation of freshly germinated weeds is the weeding method of choice for efficiency. Between complete, fast elimination of weeds before they've matured and the opposite - weedy anarchy - lies a middle path of mowing. Unlike cultivating weeds and unlike not controlling them at all, keeping pathways between rows mowed instead is less work, more edible weeds potential, and less topsoil and moisture loss that occurs when soils are bare. Some farms, especially ones that grow perennial crops (and thus have semi-permanently established beds), rely on mowing and "living mulch" pathways. Some supplement maintenance of hard-to-reach areas with a hand scythe, weed-wacker, or walk-behind weed trimmer.

Lindsay Napolitano: "I primarily manage with a hand scythe. During the height of the season we mow twice a month in the pathways. We do a double mow in May, June, and July, and one mow in August and September. During the growing season, it's mostly me and a hand scythe and a whole lot of shutting up and listening to the plants. They are the ones running the show for sure."

Jordan Schmidt: "I still try to keep dandelions out of herb and vegetable beds but just mow pathways rather than cultivating them."

**Seasonal partition.** Aside from spatial partitions, temporal division between sown and wild crops is another possibility for edible weed management. As with quick-growing cultivated crops rotated in-season (for example: radishes followed by lettuces followed by kale in the same bed), edible weeds can also be rotated in and out of a bed. Annual edible weeds discusses in this guide peak either in early spring or in early summer. Farmers who welcome certain edible weeds and know when to expect them could leave gaps in their crop plan for one or two seasonal flushes of wild greens between sowings.

**Perennials on the edge.** Weeding suggestions in this chapter focus on annual edible weeds. However, field margins and hedgerows can host a great abundance of weedy wild foods as well Perennial habitats present

very different considerations from actively tilled growing zones. Importantly, areas of lesser disturbance manifest richer ecological continuity. Such areas can reach further successional stages, thus growing toward greater plant diversity - which, in turn, invites greater animal diversity.

Managing perennial habitats on a farm asks the grower to enter into a long-term, committed relationship, since decisions made in such areas may have reverberating impacts on the entire local ecosystem for years to come. Some impacts may not make themselves visible for a long time. For example, the ecosystem gifts offered by one tree reaching maturity are best evaluated from the vantage of the tree's complete lifespan, yet may only become obvious to human land stewards after the tree is cut down. On agricultural lands, where habitats are already fragmented and wild animal and plant inhabitants rely heavily on available lesser-disturbed areas, management decisions pertaining to the edgelands are especially significant. Plus, these "unruly" areas are often in riparian zones, which means that protecting such zones may also serve a role in protecting water. Weeds may offer a role in protecting water.

Faith Gilbert: I am interested in perennial crops. These small, delicate, interesting texturally, semi-wild products. Or a stand of nettles. Tree crops or shrub crops that have some other landscape purpose: things like sumac and autumn berries. The fact that we have a garnish market I've always seen as a gateway to being able to perennialize parts of our landscape. Allowing ecosystems to be what they are: being able to celebrate wet spots. If the needs of those plants and the ecosystem lined up, then we would be glad for a revenue stream that allowed us to cultivate and protect those spaces."

Countless books have been written to advise land stewards on how to understand and work with perennial landscapes. The complexity of these management decisions is far beyond the scope of this guide (find further reading suggestions in the bibliography). With this in mind, here are a few considerations on harvesting weedy perennials from field margins:

Edible perennial weeds that frequent agricultural edgelands are commonly species that spread vegetatively and quickly, such as stinging nettle, autumn olive, Japanese knotweed, common milkweed, sumac, and daylily. To keep populations from spreading too far, harvest and weed from the outside of a patch, working around the perimeter first, then toward the center. This will keep the growing edge depleted, slowing population spread and reducing traffic within the patch. Additionally, this approach minimizes the risk of disturbance agitation that, in some species, stimulates growth. As mentioned in the previous chapter, some perennials are adapted to repeated cuttings. To an extent, cutting them will initially stimulate their growth, but eventually they will exhaust their energy reserves and slow down. At Essex Farm, for example, Mark Kimball scythes Japanese knotweed twice per season, which - in the Adirondack mountain climate, at least - keeps the stands from spreading quickly.

### Holding space, giving space:

Lindsay Napolitano: For the most part, I don't do much traditional weeding anymore, where I pull roots out of the soil. I had this experience a number of years ago where I was out there and I was doing so much weeding. It was crazy how much work we were doing to try to get the plants. I was still in the mindset of, well, I put this plant here, so I need to make sure it stays here. I just looked around and thought, we look like ridiculous human beings right now. The amount of effort we are applying to scrape plants out of the ground! Next year, I switched to primarily to using a Korean hand scythe. It's now the most used tool on the farm. It's small and light, so I don't put a lot of stress on my wrist. That enables me to do weed management through primarily chopping and dropping. If a plant is coming up that I don't want to see next to a population of plants that I do want, I will start agitating it early in its growth habit, but that's mostly to give more

spacial room to the species that I do want there. If I'm not managing for that and am just managing for a population that I don't want to get "out of control" in the system, I hit it right as it's about to go into flower because the plant is putting so much energy into its reproductive phase that when you hit it, it confuses the plant. The plant starts putting really quick and fast energy to get right back to flower but it has less strength. So, you hit it again after that. That's primarily how I manage for populations I don't want. It's hitting it at a really strategic point in its flowering. It's not so much that I control for individual plants, but I select for broad species populations. If there's a plant I don't want to see a ton of around, I'll be hitting it during its active phase. If there is a plant I do want to see around, then I'm going to mostly be giving them space. Space is what plants respond to most. They feel their way out into this world. If they feel there is another plant coming up next to them, they will actually move over accordingly. Sometimes they will contort themselves to not move into that space. It's such a misnomer when people say "competition," because it's not competition the way we think about it. It's more collaborative in the sense that plants are just responding spatially to each other. If I want to see a plant proliferate, most of what I'm doing is giving it space to reproduce. It doesn't mean I'm hand weeding around it; I'm keeping the ground shorn in its immediate vicinity so that it understands it has space to grow.

*Wild greens for sale at Salt City Harvest Farm stand at the Syracuse Regional Market*

**Harvesting and weeding simultaneously.** As tempting as it may be to combine the perpetual task of weeding with a harvests of weeds, the only farm team surveyed for this project that practiced this combination is Salt City Harvest Farm - a community farm for whom commercial production is not the priority. For most farm businesses, harvest days are a race against the heat, and thus profits from harvesting weeds for market must be weighed against consequent losses to efficiency. As Nicole Starosielski of Ramble Bramble Farm explains, hand-weeding and harvesting weeds represent two distinct arm movements. "The amount of harvesting I do does not make a dent in the weeding," says Starosielski. "Plus, I harvest for quality. With dandelions, for example, I only want to snip big leaves. if weeding, I will pull the plant out." When taking into consideration crop quality, weeding efficiency, and harvest storage time in the field, most farmers agreed that it takes longer to harvest and weed together than separating the two tasks.

Matt Potteiger: "Every time Salt City farmers go out, they are harvesting. They weed and harvest at the same time in a couple of different ways. Sometimes they go through and harvest what are weeds, then harvest [vegetables]. A lot of the time, they harvest [weeds] selectively, then weed the rest. The weeding is really complex. For example, lamb's quarters and pigweed: they will pinch off the tops and leave the plant for another harvest the following week. The farmers are managing the weeds for sustained harvests. For volunteer farmers, it's an incentive for weeding. It's a task with immediate rewards."

## SOWING WEEDS

There comes a point where farmers who have discovered the delicious virtues of edible weeds inevitably ask: can I grow this? The impulse to fold wild plants into the patterns of a commercial farming operation are certainly understandable. Sowing edible weeds may mean bigger, more reliable yields and easier, more efficient harvests. Sowing weeds also presents obvious drawbacks: the potential of spreading readily establishing non-native species, the loss of wild phytonutrients through repeated seed selection, and a much larger up-front energy investment into encouraging the crop.

A few better known edible weeds can be found in seed catalogs. Some of these commercial seeds are saved from wild populations, while others are the result of patient domesticating efforts that augment those properties of the plant desirable to the farmer or the eater. For example, cultivated dandelions tend to be less bitter than their feral counterparts, while cultivated purslane grows more upright and robust.

Among farmers surveyed for this guide, by far the most popular species that growers first got to know in the wild and then transplanted to more convenient locations were stinging nettles. Nettles prefer wetter soils but tolerate a wide-range of conditions and are easily propagated via stem cuttings or by division of their extensive rhizomatous root network. At Essex Farm, Mark Kimball transplanted nettles into rows from an existing patch on the farm and has been growing them for the past nine years. At Red Oak Farm, Taylor Tribble has a practice of digging up nettles when they pop up in his pastures and transplanting them to dedicated nettle areas that are too wet for any other crops. Tribble isn't interested in growing nettles in rows because in his experience, they "crowd everything else out and do just fine on their own."

### Saving burdock seeds:

One wild food plant that Taylor Tribble of Red Oak Farm grows out in rows is burdock because its deep roots are much easier to harvest out of garden soil than from fence lines or field edges. Seeds are gathered from the farmscape and then sown in rows. Tribble lightly hoes around young burdock plants once. After that, the burdock is able to outcompete most neighboring weeds. Tribble saves his own burdock seeds for two reasons: burdock seed is expensive to buy and the seeds are available abundantly right in front of him.

How to save burdock seeds:

1. Leave a few second-year burdock plants to go to seed (Burdock is biennial).
2. Collect dry seeds into a giant burr ball.
3. Place burr ball into a bag and squeeze bag repeatedly until seeds and chaff separate.
4. Winnow seeds in wind. Voila!


*Stinging nettles are also readily started from seed. The Hudson Valley Seed Company is one Northeast source for organic, regionally-adapted nettle seeds.*

# A SEED FARMER'S FRUITFUL COLLABORATION WITH A WEED

BY NATHAN KLEINMAN

I started the Experimental Farm Network (EFN) with my friend Dusty Hinz in 2013. The basic idea was to create an online platform to facilitate collaboration on plant breeding projects and sustainable agriculture research. In particular, we wanted our network to help drive innovation and the development of new perennial staple crops for carbon sequestration and climate change mitigation. From our base in Philadelphia, we began preparations to start a non-profit, quickly decided to try funding our operations through growing and selling seeds, and soon started looking for land. In early April of 2014, after a couple promising options fell through, we found ourselves camped out in a South New Jersey field on a small family farm belonging to Sandy and Chris Deitrich. They were and are wonderful hosts, but we had only just met them and knew we needed to give them their space, so we cooked our meals on a camping stove and went without refrigeration or running water for the next four months as we set out filling a 3-acre strip of land with interesting plants from around the world.

From our earliest days on the farm, Sandy and Chris told us to look out for the "wild broccoli raab," which they said was in season already. It took a few days for us to find it, but then we realized it was all around us. We were smitten. We started eating it every day, raw and cooked. Since the Deitrichs' chickens kept us with a steady supply of eggs, our favorite way to eat the wild broccoli raab was scrambled in olive oil with eggs and garlic (and it's hard to improve on that recipe). We ate it for the next few weeks, and by the time it all bolted we were ready to move on to the Deitrichs' asparagus and the kale and other greens we'd planted. That first year was a whirlwind — we trialed over 500 different crops — so we didn't think much about the wild broccoli raab until that fall when we started seeing a beastly *Brassica* with dark green, bristly leaves, growing close to the ground in a two-foot-wide rosette. We soon realized this was the wild broccoli raab (those leaves are tasty cooked too), and as fall turned to winter and winter turned to spring we marveled at its transformation: the core of each rosette stayed green and vibrant throughout the winter — even when frozen solid — then re-emerged as a paler, nearly bristle-free, slender-leaved shadow of its former self. I almost couldn't believe they were the same plant. But, sure enough, in March of 2015 they started shooting up the same sweet, tender flower spikes we had so relished the year prior.

During that first year, I assumed the wild broccoli raab was just a common field mustard, but a few weeks after it started flowering in 2015 I noticed our patch of overwintered 'Seven Top' turnip was just beginning to flower — and they looked almost identical. The 'Seven Top' was smaller and less productive, and it started flowering much later (sometimes, the wild broccoli raab was already in flower during the last few snowfalls of the winter), but the resemblance was clear. A close examination of the roots of the wild broccoli raab then revealed that a few of them were clearly small turnips, so I realized that what we were dealing with was not a field mustard but a feral turnip (or *Brassica rapa subsp. rapa,* a close cousin of field mustard, which is *Brassica rapa subsp. campestris*, a very different

plant). Suddenly this plant made a lot more sense. South Jersey has long had a large Italian-American community, and Italian crops like broccoli raab and dandelion greens have long been popular among local Italian-American farmers, so we can only assume that some Italian strain of *rapini* or *cima di rapa* escaped cultivation and established itself in the hedgerows, roadsides, and abandoned fields of Salem, Cumberland, and Gloucester counties. (I've also since realized that some of the "wild chicory" growing at the farm resembles the cultivated Italian varieties often sold as "dandelion greens," but that's another story.) We decided in 2015 to start saving seeds from the best individual plants and began planting intentional beds of it ourselves. We knew that this was a special plant — it can outcompete perennial grasses in a hayfield, and its extreme winter hardiness and incredibly early flower production make it an invaluable "hunger gap" food — so we wanted to produce lots of seed and start sending it around to EFN volunteer growers to see just how special it is. Overwintering success in Alaska has proven that it is very special indeed.

*Wild broccoli raab transplanted into the field*

*All photos in article: Nathan Kleinman*

*Wild broccoli raab in December, with feet for scale*

As our relationship with this plant deepened, we started noticing it elsewhere in the region — occasionally even filling entire fields left fallow. I could spot it while driving, and would often pull over to the side of the road to harvest some. But I came to realize that the plants growing at the Deitrichs' contained a much higher proportion of extra-large plants — the kind that send off dozens of flower spikes, instead of just a few. Even at the Deitrichs', the plants are highly variable: some big, some small, some tinged purple, some solid green, some with turnip-like roots, most without. When we started selling seeds for 'Deitrich's Wild Broccoli Raab' in 2016, and decided to attach the Open Source Seed Initiative pledge to the variety (to prevent future growers of the plant from trying to patent it), I started wondering why the Deitrichs' population was already so much better than the random wild plants we would find around the area, even before we began selecting for the biggest, earliest individuals. The answer, of course, was the Deitrichs themselves. For 35 years, they had been harvesting flower spikes every spring. Chris keeps a close eye on the world of the farm, so is ready to start harvesting as soon as the first wild broccoli raab plants begin flowering. Chris and Sandy go back to the same patches year after year. Inevitably, they harvest most from the biggest plants and don't waste much time on the small plants, which often just send up one flower spike anyway. The most vigorous plants can be picked from for weeks, replacing the plucked flower spikes with a seemingly inexhaustible supply of more — until the picker gets tired of broccoli raab and the plants finally get to bolt. This has resulted in extra diversity in the Deitrichs' population, with the plants practically segregating themselves into two distinct populations: smaller plants, which are allowed to flower first, and bigger plants, which flower weeks after their smaller brethren have already started ripening seed. Of course, Chris and Sandy's simple act of leaving space for weeds at the farm — which far too many farmers no longer do — created the habitat to allow this population to flourish.

With no intention of doing so, the Deitrichs have been breeding exceptional wild broccoli raab. A few years of additional selection (or "re-domestication") by me and Dusty has led to an even more exceptional population, which we believe far exceeds any cultivated variety of broccoli raab — for vigor, productivity, pest resistance, winter hardiness, and even taste. We raised a few eyebrows when we started selling seeds for it ("why would anyone buy *weed seeds* from you?"), but it's now one of our best-selling varieties. It receives rave reviews from everyone who grows it, from home gardeners to professional chefs, and has become one of our signature crops.

# CHAPTER SEVEN

# LIVELIHOOD FROM A WEED

Adding edible weeds to the harvest list is not an appealing idea to every farmer and, perhaps, for good reason. Growers whose businesses revolve around a handful of crops, who have thousands of acres under cultivation and spend most of their days behind the wheel of a tractor, or who have been so successful in their war on weeds that they have no wild crops to harvest, are unlikely to bring dandelions to market. For small, organically managed produce farms, however, a partnership with edible weeds can be fruitful.

This chapter introduces the benefits and challenges of bringing edible weeds from the farm to the market and shares an overview of techniques well-suited to educating and engaging customers about wild foods.

## WHAT KINDS OF FARMS DO EDIBLE WEEDS BENEFIT?

Organically stewarded vegetable farms have the greatest weeds: the rich soils required by most cultivated crops grow large, healthy edible weeds too - and each frequent soil disturbance from a root harvest or tilling is equivalent to a re-sowing of weeds. Organic land management is, in itself, a commitment to co-existing harmoniously with weeds; growers who agree not to poison their weeds are rewarded with bonus harvests of wild crops.

According to the United States Department of Agriculture, small farms (defined by annual gross sales of $250,000 or less) average 231 acres in size. According to the results of the farmer survey conducted for this guide, edible weed harvests are most popular among the smallest of small farms: operations under 10 acres. However, about one quarter of survey participants operate farms between 50 and 200 acres in size. Since annual weeds are attuned to subtle differences in soil conditions and pop up in patches throughout a field, the maximum scaling up of edible weeds as crops depends on how much time a grower is willing to spend on a harvest process that differs from that associated with the grid-like nature of row crops. Within the catch-all of small, organic, produce farms, harvesting edible weeds for market can be particularly beneficial for the following types of operations:

**CSA farms.** Essex Farm, a family-run farm that uses draft horses and operates a year-round full-diet Community Supported Agriculture Program for over 200 households, adds Japanese knotweed, chickweed, dandelions, stinging nettles, wood sorrel, garlic mustard, and wild grapes to their shares, thereby introducing members to novel nutrition while simultaneously managing populations of spreading weeds across the farm's 1,500 acre property. Farmers who operate Community Supported Agriculture programs can find it challenging to grow enough crop diversity to keep members satisfied for the duration of the growing season - particularly if they have no other outlets for selling less-known vegetable varieties. Edible weeds provide easy, unique contributions to a CSA share without the worry of having crops or hard work go to waste. Many growers who bring edible weeds to market and offer them to restaurants started by trying out these novel wild edibles through their CSA shares.

**New farms.** New farmers juggle risks, uncertainties, and luck, often stumbling through their first season with more obstacles than they ever imagined. At this delicate and crucial moment in the life of a farm, edible weeds can provide a small but reliable insurance policy. When seeds planted on a precise schedule and watched over with attention usually reserved for newborn babies just aren't ready in time for the first market day, edible weeds are ready to come to the rescue. Knowing that no matter what unpleasant surprises befall a young grower, the land will provide some harvestable crops provides relief every farmer deserves.

Faith Gilbert: "Based on our personal history, I would say edible weeds are most advantageous to small farms starting out that are trying to fill out their product line or trying to demonstrate unique offerings and make their place in the market. Or, they have access to high end

specialty markets. I think chefs are always going to be the main demographic for purchasing the most volume of edible weeds because weeds are often preparation intensive. I've seen other produce farms, as they scale up, drop those minor components and focus on fewer larger things."

**Farms without season extension.** To farm in a northern climate is to be on a perpetual search for creative, often expensive, sometimes energy intensive, and rarely simple techniques for growing a diversity of vegetables in a short season. Season extension infrastructure is a staple of established produce farms throughout the Northeast but may not be an investment accessible to a beginning farmer on a shoe-string budget. Without some extension, a grower's early spring offerings are lean at best - and occur at the whim of unpredictable weather patterns that can slow early-sown seeds to a near halt. For farmers who find themselves in such a predicament, one answer lies in the land itself. Sown crops may still be tiny in early spring, but the fields are unlikely to be empty. Bright, green chickweed may be growing into lush patches; burdock is likely emerging along the perimeter in a constellation of velvety rosettes; delicate, fragrant field onions are probably waving their cylindrical stems from fallow rows; and beyond the reach of the mower blade, there may be a community of stinging nettles putting on their most spectacular color display of the year: their young leaves a palette of rich indigo-green to pure purple.

Faith Gilbert: "We barely sell any foraged crops at the farmers' market now. We did in the early days when we had very, very few things to sell in the spring. We've been pushing the season extension on our farm where that's not so important to us anymore. It's not worth the time at this point."

Jordan Schmidt: "The dandelion sale was totally great and worthwhile for me. For several years, it allowed me to do a bulk harvest at a time of year when I didn't have anything else to sell."

**Farms with kitchens.** Farms that make value-added products stand to benefit from incorporating wild foods into their offerings. Edible weeds provide a free, flavorful bulk of ingredients that lend themselves to a myriad of recipes, from baked goods to ferments, frozen soups, seasoning salts, sweet preserves, tonics, syrups, and much more. Such unique offerings can open new sales outlets to a farm and attract new customers, especially ones interested in wild food and medicine but lacking the confidence or resources to prepare them. Lindsay Napolitano, of Fields Without Fences farm, encourages weeds to grow alongside cultivated crops and uses both to make herbal tea blends, tinctures, elixirs, syrups, and infused botanical oils for her market customers and herbal CSA shares.

Blake Arrowood: "Sumac grows all around us on the periphery on the edges. So we are constantly picking that and drying it and experimenting with it in different ways, not just in beer but in-house teas and lemonade. Dandelion started our cuvée series which is taking from this French idea of single source, single origin, single barrel beer. We did this with our dandelion saison. Agriculture is so intensive, no matter what you do. The hops production is so intensive, I almost want to rip them all out. But, when you've got the dandelions: what did we do for that? Nothing. We are just able to honor it. In a way it preserves a part of that season: the story of that season is now in the bottle. To be able to do that without this active cultivation is in-step with nature. Being able to tap into that as a farm brewery is something we've tried to do since day one. We are continually trying to tap into anything we can to be more in line with our surroundings and nature that our land provides. I cant wait to have more time to understand what our land is offering and what else we can do to show that expression."

Jordan Schmidt: "It's interesting because so often, it ends up being that when you can make

money on edible weeds, it's for a boutique, value-added product. I wish, in some ways, they were just treated as food. But, maybe that's how people start to gain exposure."

**Farms that welcome people.** For some farmers, the practice of growing food is inextricable from the goals of growing a socially just world. Wild foods can strengthen inclusive community relations by uplifting the cultural, culinary narratives they inspire from across the planet. FARMroots (New York City), which is a part of the non-profit GrowNYC (previously known as the New Farmer Development Project) is an organization that supports aspiring immigrant farmers to start their own businesses in the United States. Partnering with New York City's network of farmers' markets, FARMroots was able to provide the new farmers places in the markets, along with additional business support. Former project director Michelle Hughes shares that, in the early 2000s, when farmers from Mexico, Jamaica, and a few other Central American and Caribbean countries who were part of the training program began bringing wild greens to markets. The greens, which grew spontaneously as weeds on their farms in the (New York, New Jersey, Pennsylvania) tri-state region and were familiar to the farmers from their home countries, were a big hit, especially among customers from the same regions as well as Eastern European immigrants who recognized the same weedy species from their cultural cuisine. "Wild plants were a huge part of their business," Hughes explained. "They sold purslane as verdolaga, lamb's quarters and pigweed as quelites or calalloo, etc. There is a huge market for this in immigrant communities in New York City and the fact that farmers were bringing these foods to market actually helped Greenmarket open farmers markets in new neighborhoods. But, obviously there is more education and marketing involved in selling to communities that don't have or have lost traditions of eating these wild foods." Salt City Harvest Farm (Syracuse, New York), whose story is described in the next chapter, is another great example of building cross-cultural communities through wild foods.

**Farms that grow resilience**. Although it is hard to find an organic grower who doesn't want to improve the environment through their growing practices, some farms make building ecological balance while growing crops an explicit part of their business mission. Guardian of the weeds Bob Cannard tells his customers that 50 percent of the biomass Greenstring Farm produces is for people, while 50 percent is for nature. Hawthorne Valley Farm (Harlemville, New York), whose mission is "nurturing the land that nurtures us," runs multiple educational programs for adults and children that teach about rich ecological interactions on diversified farm landscapes. On farms like Greenstring and Hawthorne Valley, the symbiosis between farming and ecological processes is integrated into the farm stewardship plan and emphasized to the customers, some of whom choose to support the farm because of their environmental goals. Since harvesting feral plants firmly aligns with the goals of stewarding ecological resilience, customers of "eco-farms" may be more receptive to buying novel, wild crops that direct their food dollars toward greater inter-species good.

## PRICING EDIBLE WEEDS

Although wild crops require a far lower financial investment than sown crops, most growers who participated in this study did not treat wild edible plants differently at the point of sale.

Nearly half of the growers surveyed determine prices for edible weeds by matching them to market prices for comparable cultivated vegetables. Around 15% used labor time of harvesting and processing to decide the price. Another 15% searched for prices online, and another 15% simply guessed the price. The remaining 5% folded the price of edible weeds into their overall CSA share fee. Taylor Tribble's policy is to charge a bit less for edible weeds than for cultivated produce because wild foods require less work from him to bring to market. Foragers Avery McGuire and Edward Blain, of Thalli Foods, warn against undervaluing wild foods:

Avery McGuire: "There were vegetable growers at market who would sell small bags of wild things they harvested for 50 cents per bag. You are devaluing that plant and making it appear to the customer that it's not that valuable. It's funny because in one way, it's great when wild foods

are 50 cents because it makes this very nutritious food accessible, but actually when people turn up at the market and see something is 50 cents, they buy it and don't care if it sits in the back of their fridge and wilts. It's important that [wild foods are] on par with the other vegetables. They shouldn't be so expensive that people cannot but them, but shouldn't be so cheap."

Edward Blain: "Using the products ourselves was important so we knew how much we used and thus how much to price it. Chickweed for $30 a pound sounds expensive at first, but it's very light. Plus you don't need as much volume as cultivated [produce]. For example, it may take you a bit longer to harvest chickweed than spinach, but you're not scaling up or planning for wild greens in the same way as your cultivated crops. You are just taking whatever chickweed you can or want. The current economic system is crazy in terms of price of food. There are so many hidden expenses; it's hard to produce food cheaply. Personally, I value hand-harvested things. Fair living wage has to come first."

## MARKETING EDIBLE WEEDS

Perhaps where culinary weeds and cultivated crops diverge most is at the point of sale. Mainstream American food culture is conservative and introducing a new product, let alone a produce item harvested from an unfamiliar wild plant, asks for finesse and patience on behalf of the farmer. Encouraging a customer to veer away from their routine shopping list and become open to the possibility of new taste, nutrition, and, perhaps even new way of conceptualizing food will not work without also building trust. Edward Blain believes that for small farmers, a personal relationship with customers, whether they are home cooks or professional chefs, is the key to marketing wild foods. "If you customer trusts you, they will try something new," says Blain. Taylor Tribble of Red Oak Farm loves the challenges and advantages of peddling wild foods because, he explains: "one third of my customers know it; two-thirds want to try something new, like it, and come back." For farmers open to making space for edible weeds on their stand, here are a few considerations for market day:

**Storage**. Wild greens tend to have less tolerance for heat stress than their cultivated counterparts. At market, all wild greens are best treated on par with the most delicate domesticated greens rather than sturdier species like kale or collards. McGuire and Blain recommend packing greens into compostable bags or containers, leaving a few out for display, and keeping back stock in coolers. "Unfortunately, it's more waste," McGuire explains, "but there would be more wasted food if people didn't buy it."

**Presentation**. Faith Gilbert is also a fan of packing edible weeds in clamshells (containers with lids, usually made of clear compostable or single-use plastic), for different reasons:

Faith Gilbert: "We tried selling edible weeds in a number of ways. We sold them by the pound, by bunch, and lastly in clamshell (no specified weight, just volume). We found that selling in clamshells was by far the most lucrative and successful way. It helped us get better quality control. When we were selling purslane by the pound, we would need a whole lot of purslane plants. We would need as much plant material as we could get. And, we found that purslane quickly became susceptible to some fungal thing and would lose quality. When selling in clamshells, we could snap only the ends of the plants and guarantee that if we listed purslane, we could get a good looking crop. I think people were willing to pay the premium for a storage container that kept the product quality. Also, there was an assumption on both sides that if it was in a clamshell, it would be garnish quality: little ends of the plant picked through for quality, rather than a bunch of weeds. People order those five at a time, which is astounding to me still. It's the equivalent of something like $20-$30 a pound if we sold it by pound weight. Purslane

**is not a major crop by any means but on par with some of the rare vegetables that we grow."**

For other growers, bunching or selling wild foods by the pound fits better with their established marketing. Blain and McGuire have seen purslane that's uprooted and bunched together on offer at markets. "But you can only eat a few leaves," explains Blain. "You're better off buying kale so you can eat the whole thing for the same price." "It's important to think about how the green will be consumed to make it most appealing to the customer," McGuires adds.

**Avery McGuire: "There's a gap that needs bridging between the act of weeding and the act of harvesting food. When farmers see chickweed as a weed, they want to pull it out with the root. When we see it as a food, of course, we only want to harvest the tips. One farmer told us if he tries to sell a bag of chickweed, people at the market look at him like he's trying to sell a bag of weeds. Well, yes, if it's pulled out like a weed and shoved in a bag, it does look like that. If the tender tips are cut off or if it's mixed in a salad bag, it looks a lot nicer."**

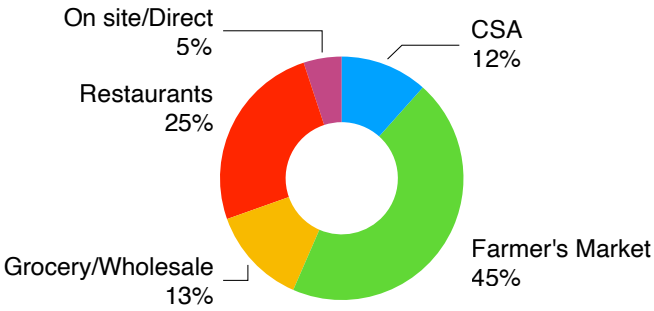
**Usability**. It's important for a farmer to have experience or understanding of the wild food they are selling so they can help acquaint customers with these novel foods. Just as with cultivated produce, knowing how a plant tastes and how to best prepare it goes a long way toward establishing comfort and trust between grower and eater. To ease a customer's introduction to a new edible plant, Blain and McGuire suggest minimizing the steps between purchase and plate. For example, for wild salad, select leaves and tender tips that are bite sized and pre-wash the greens so they can be served immediately upon arriving in the customer's kitchen.

**Signage**. Market signs can provide an inviting snapshot for a novel ingredient. Consider short descriptive phrases like:

- Dandelion - sharp salad green
- Purslane - rich in Omega-3 fatty acids
- Japanese knotweed - just like rhubarb
- Chickweed makes great pesto
- Ask me how stinging nettles loose their sting

Some edible weeds, particularly ones beloved in many cultures, go by varied common names. Consider researching ahead and listing multiple names on market signs. For example, some know *Chenopodium album* as lamb's quarters, but it also goes by quelites, goosefoot, fat-hen, bathua, pigweed, and wild spinach.

WHERE EDIBLE WEEDS ARE SOLD:




*(as reported by the regional farmer survey)*

**Additional resources**. Some farmers receive great customer feedback from sharing stories about and guidelines for novel ingredients in email newsletters. This, however, can be a time-intensive undertaking. Sharing recipes is easier and also goes a long way in helping customers feel confident, brave and prepared to try a new food. A collection of edible weeds recipes are available at the back of this guide, ready to print and bring to market. A plethora of additional ideas can be found online.

**Wild factor.** Some farmers choose to emphasize the "wildness" of a crop in describing the plant to customers while others opt for underplaying this in an effort to smooth out the socially-constructed dichotomy between the domesticated and the wild. Taylor Tribble prefers the latter: "I don't hide the fact that foods are wild but I do try to normalize them. I just talk about them as another crop rather than something unusual and 'wild'." Conversely,

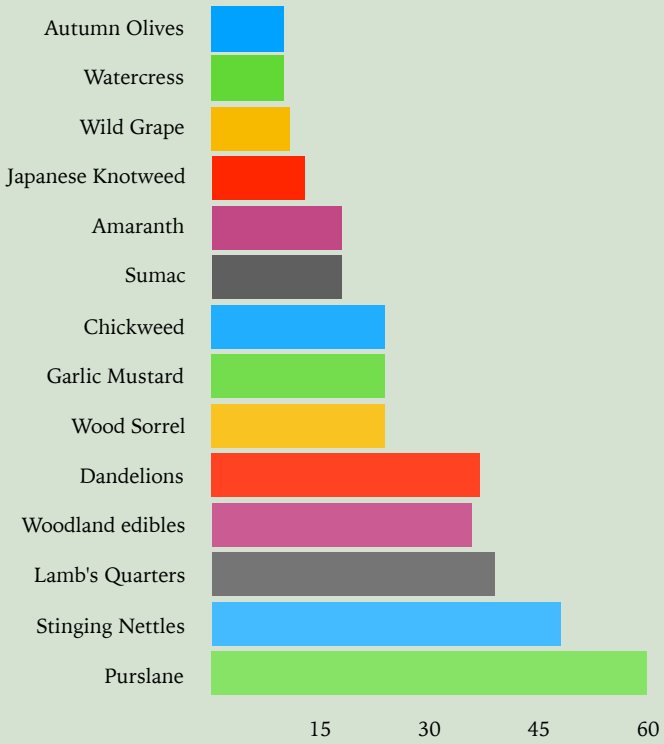
customers of Thalli Foods often seek them out precisely because the food is sourced from "the wild." McGuire explains that it is appealing to their customers to consume wild plants because they consider them more nutritionally dense than cultivated produce and thus better for health. Blain adds that the fact that foraged foods are less energy-intensive to acquire than farmed produce is also a selling point for some sustainability-conscious customers.

**Faith Gilbert: "In terms of the wildness factor, we have a broad clientele for both wholesale and retail that is not homogenous in their culture, but we do have a good number of clients who are pretty hip to food trends and rare and specialty ingredients. We don't really have to explain much to them. When we list wood sorrel or purslane, we just list them as such with no explanation and that seems to work out fine."**

**Working with chefs**. Many farmers and foragers who sell edible weeds find their most enthusiastic customers to be restaurant chefs in the fine-dining world. In Faith Gilbert's experience, "they already know [the wild ingredients], are familiar with using them and order several at a time." McGuire and Blain also often sell to chefs and suggest approaching those relationships based on marketing preferences the farmer already uses for their sown crops. "It just depends on what the farmer is comfortable with. Sometimes, it's intimidating to phone up a chef because it can feel like they have no time for you." If the farmer is already supplying through a distributor, try offering edible weeds to chefs through that existing system. Blain also warns against offering chefs many new items immediately: "Introduce new things one at a time. The result of introducing 20 different things at the same time is that they will pick up one or two things. They are busy and get overwhelmed. That being said, there are some chefs who have great will to experiment and time on their hands."

## WEEDY WILD FOODS MOST SOLD FROM NORTHEAST FARMS

The farmer survey revealed that the following wild edible plants are most commonly gathered for market on farms in the Northeast.




*# out of 119 survey participants*

For farmers who are just beginning to consider adding wild crops to their market offerings, starting with this species list may be easiest, as these plants have an established or emerging market and a higher level of recognition among customers. For a comprehensive list of weedy edible species found in abundance on and around Northeastern farms, see Part Three.

## WILD AND BRED COMPARISON FOR FLAVOR AND PRICING

| Wild vegetable: | Tastes like: | Compare to at market: |
|---|---|---|
| Amaranth (*Amaranthus spp)* | spinach | sauté greens mix; bunched kale |
| Autumn olive (*Elaeagnus umbellata*) | pomegranate and cranberry | whole berries |
| Dandelion (*Taraxacum officinale)* | bitter greens such as raddichio, frisée; broccoli raab | bunched kale; head lettuce |
| Field sorrel (*Oxalis stricta)* | French sorrel; rhubarb; lemon; green apple | salad mix; specialty herbs |
| Garlic mustard (*Alliaria petiolata*) | garlicky mustard greens; mild horseradish | sauté greens mix; bunched kale |
| Japanese knotweed (*Reynoutria japonica)* | rhubarb | rhubarb; asparagus |
| Lamb's quarters (*Chenopodium album)* | spinach | sauté greens mix; bunched kale |
| Stinging nettles (*Urtica dioica*) | spinach; seaweed | sauté greens mix |
| Purslane (*Portulaca oleracea*) | swiss chard; rhubarb | salad mix; head lettuce |
| Sumac (*Rhus spp)* | lemon | specialty herbs; garlic |

## WEEDY EDIBLE FLOWERS OF THE NORTHEAST

| Species | Flavor | Season |
|---|---|---|
| Asiatic dayflower (*Commelina spp*) | pea-like | summer |
| Bee balm (*Monarda spp*) | sweet and peppery | summer |
| Black locust (*Robinia pseudoacacia*) | sweet, pea-like | spring |
| Chicory (*Cichorium intybus*) | neutral | summer |
| Clover (*Trifolium spp)* | neutral to sweet | spring, summer |
| Common mallow (*Malva neglecta)* | neutral | summer |
| Common milkweed (*Asclepias syriaca)* | sweet | summer |
| Dame's rocket (mustard) (*Hesperis matronalis)* | spicy | spring |
| Dandelion (*Taraxacum officinale)* | sweet | spring |
| Daylily (*Hemerocallis fulva*) | neutral, onion-like | summer |
| Eastern redbud (*Cercis canadensis*) | sweet, slightly tart | spring |
| English daisy (*Bellis perennis*) | neutral, bitter | spring |
| Evening primrose (*Oenothera biennis)* | neutral | summer |
| Field onion (*Allium vineale)* | onion-like | spring |
| Field sorrel (*Oxalis stricta)* | lemon-like | summer |
| Forsythia (*Forsythia suspensa*) | spicy, bitter | spring |
| Garlic mustard (*Alliaria petiolata*) | spicy, sweet, bitter | spring |
| Goldenrod (*Solidago spp)* | spicy, bitter | summer, autumn |
| Oxeye daisy (*Leucanthemum vulgare*) | peppery | summer |
| Norway maple (*Acer platanoides*) | sweet | spring |
| Pineapple weed (*Matricaria discoidea*) | citrus-like | spring, summer |
| Salsify (*Tragopogon spp*) | neutral, sweet | spring |
| Violet (*Viola spp)* | neutral, sweet | spring |
| Wild roses (*Rosa spp)* | sweet, floral | summer |
| Yarrow (*Achillea millefolium)* | spicy, bitter | summer |

The most popular marketing tip shared by farmers for this guide was the suggestion to incorporate wild ingredients into salad and braising mixes. Mixing greens along with better-known cultivated varieties alleviated the fear of trying new foods for some people, softened strong-flavored or unusually textured greens, and provided a way to stretch a small amount of a unique ingredient. This table provides introductory orientation for adding edible weeds to mixes. *Avery McGuire had a related suggestion for farmers who send out a wholesale list. Instead of listing individual ingredients, she recommends farmers try adding "wild salad mix" as one item. They can then curate the composition based on species availability and order size.*

INTO THE SALAD MIX

| Wild vegetable | Braising max | Salad max | Flavor | Cut to bite size? |
|---|---|---|---|---|
| Amaranth (*Amaranthus spp)* | 100% | | nutty spinach | No. Use leaves only. |
| Chickweed (*Stellaria media)* | | 75% | mild lettuce | No. Use leaves, flowers, and stem. |
| Common mallow (*Malva neglecta)* | 50% | | neutral, mucilaginous | No. Use leaves only. |
| Dame's rocket (*Hesperis matronalis)* | 50% | | kale, mild mustard, slightly hairy | Yes, or baby leaves only. |
| Dandelion (*Taraxacum officinale)* | 25% | 10% | bitter, semi-sweet | Yes, or baby leaves only. |
| Field onions (*Allium vineale)* | | 10% | chives | Yes. |
| Galinsoga (*Galinsoga parviflora)* | 25% | | neutral, slightly hairy | No. Use leaves only. |
| Garlic mustard (*Alliaria petiolata*) | | | bitter, garlicky | No. Use leaves, flowers, and stem. |
| Hairy bittercress (*Cardamine hirsuta)* | 50% | 25% | spicy-sweet watercress | No. Best as full rosettes. |
| Lamb's quarters (*Chenopodium album)* | 100% | | nutty spinach | Yes. |
| Mugwort (*Artemisia ambrosifolia*) | 10% | 10% | bitter rosemary | No. Use young leaves only. |
| Oxeye daisy (*Leucanthemum vulgare*) | 25% | 10% | grassy, chrysanthemum | No. |
| Pineapple weed (*Matricaria discoidea*) | | 10% | citrus, chamomile, black pepper | No. Use leaves, flowers, and stem. |
| Purslane (*Portulaca oleracea*) | | 75% | lemon, rhubarb, chard | No. Use leaves and tender stems. |
| Sheep sorrel (*Rumex acetosella)* | 25% | 25% | lemon, green apple | No. |
| Stinging nettles (*Urtica dioica*) | 100% | | salty spinach, slightly gritty | No. Use leaves and tender stems. |
| Wintercress (*Barbarea spp)* | 50% | | mild mustard, bitter raab | No. |
| Wood sorrel (*Oxalis stricta)* | | 25% | lemon, green apple | No. Use leaves, flowers, and stem. |
| Yarrow (*Achillea millefolium)* | | 10% | bitter oregano, black pepper | No. Use leaves only. |

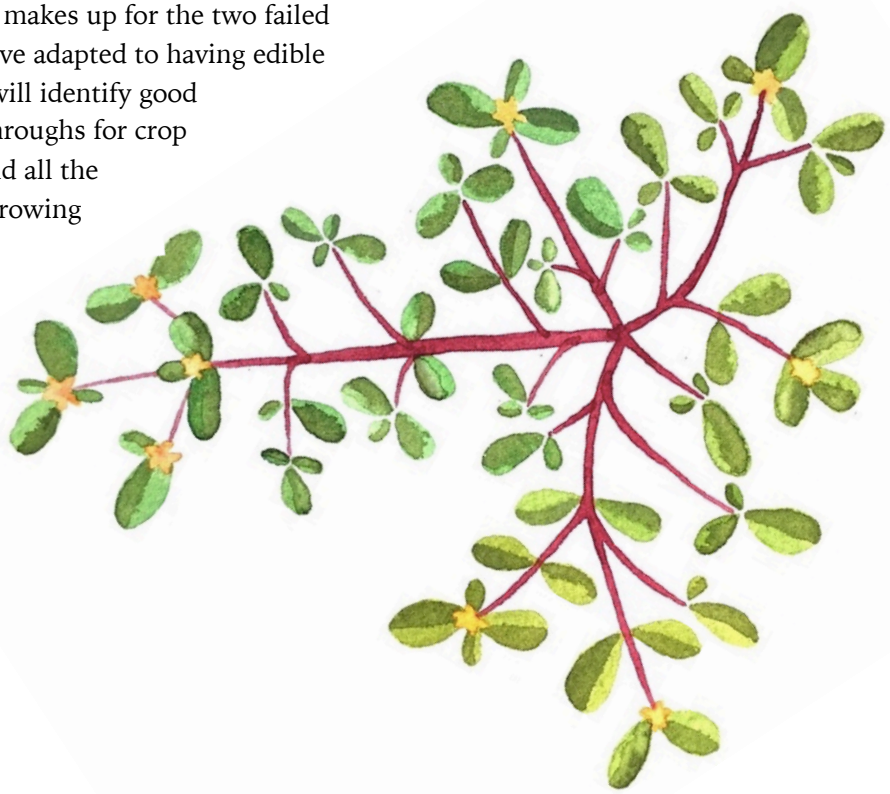
# **WEEDS AS CROPS AT LETTERBOX FARM** BY FAITH GILBERT

We started selling weeds from the beginning. We had a focus on specialty wholesale for restaurants at the time, in part we were just looking to have a certain amount of novelty that we thought would make us appealing to those kinds of accounts. Also, we were a very small farm so any income and any additional products we could for scrounge around for and add to our offerings was really helpful.

We foraged some in the very beginning, but that quickly became impractical. It didn't seem worth it to take the day off of the farm to go find things that weren't immediately available more than 100 feet away. In the beginning, they were there to diversify our offerings. We've sold things like autumn berries, sumac, garlic mustard, nettles, but cut them out in the first two years of farming. We really needed crops to fill out our market table at that time, so anything that we could potentially sell, even if we could sell a little bit, would make us look like a better farm. For restaurants, the thought was: get novelty, get cool things on the list so that people would think of us as a high-end, high-quality specialty farm. The time it took to gather weeds and the amount we sold probably wasn't profitable at the end of the day. But, when we hit on a couple of crops that really worked for us, then they very much are a financial consideration. The products that have continued to be viable and important are wood sorrel, purslane, and most recently chickweed. They were consistently available; we learned their growth cycles and when to expect them. We could sell them and then figured out the best way to sell them.

We grossed about $1000 on edible weeds in 2018 which represents about .75% of our total sales, a small number. Also, the harvest speed is very variable. Sometimes, we get a flush of wood sorrel that's beautiful and perfect and you can harvest $50 in five minutes, and other times you have to look all over the farm and scrounge for it. It's hard to access. In any given moment, it looks like a more or a less worthwhile activity. Overall, because there is no labor involved in planting, cultivating, etc, it's really just the labor cost, it always lines up. We never pay ourselves more per hour than we do harvesting ten quarts of purslane in an hour.

We are happy to have that extra $1000. It makes up for the two failed beds of carrots that didn't germinate. We've adapted to having edible weeds on the list. Everyone on the team will identify good stands of weeds. When we do our walk-throughs for crop availability and pest control, irrigation, and all the things we are trying to notice about our growing space, we will also notice that there is a beautiful crop of chickweed coming in and where that is. We found that the most important factor is identifying places where weeds are quick and easy to harvest.



# MARKETING CHALLENGES

All farmers who responded to the regional survey unanimously agreed that they would be interested in considering edible weeds as supplemental crops in the future. Some growers cited obstacles that challenge the introduction of such "new" crops at market. Concerns raised include:

| Concern | Response |
|---|---|
| **Market unknown.** The market for edible weeds is unknown, emerging, or appears non-existent, so it is hard to scale up and take a risk on a new crop. | Edible weeds are best in supporting roles, not center stage. They do not, by nature, uniformly scale up as sown crops can. Rather, they are supplemental market offerings; low-risk novel crops that augment seasonal gaps and showcase the diversity and generosity of the land. |
| **Proximity to market.** Accessing an audience that's interested in wild foods is difficult. The farm's current customer base wouldn't be interested. | Can a local distributor provide a bridge to customers farther afield seeking edible weeds? Would the existing customer base be interested in wild foods if they were incorporated into value-added products or added to salad mixes? |
| **Embarrassment about farming weeds**. Farmers feel embarrassed to bring weeds to market after hearing disparaging comments. Some growers are reprimanded or laughed at by potential customers when they see wild plants they recognize as weeds, such as dandelion greens, on the market table. Some growers feel uncomfortable with the idea of selling "weeds" because this might be interpreted by customers and other farmers as a sign of their poor performance as farmers. | The boundary between weeds and sown crops, and farming and foraging, has been drawn clearly and firmly in mainstream American society. In ecological reality, however, there is no clear boundary: wild foods and cultivated foods occur along a spectrum, not a binary. Humans who engage with this spectrum as eaters might just feel more comfortable in the world if they treated all food plants and the people who steward land where those plants grow with equal respect and gratitude for the nourishment they provide. Many of us have deeply rooted psychological barriers when it comes to so-called weeds. This should not be surprising: animosity is imbedded in our very language. So, what to do? Keep treating edible weeds with respect on par to cultivated foods. Share their stories. Host wild food cooking demonstrations at market and feed the critics until they change their mind.<br><br>Edward Blain: "There are a few stumbling blocks we have noticed when it comes to farmers selling weeds. One farmer was glad to have us picking his weeds and sell them as wild food because he said if he tries to sell purslane or chickweed at the market it looks like he's just trying to be sneaky and make some money off his "weeds." These delicious and nutritious plants might need some rebranding (which is starting to happen). I think education, time, and marketing could help change these perspectives for the better." |

**People are slow to try new things.** There is a lack of customer knowledge about edible wild plants on farms, which equates to a lack of consumer acceptance on a wide scale. As Taylor Tribble explains, the burden to educate customers is then carried by the farmer: "Sometimes, I'm busy and don't have the time to talk to a customer about [a wild food]. And, then sometimes you talk for a while and they walk away without buying."

Jordan Schmidt: "When I get frustrated about the extra, above and beyond amount of education that we have to do as farmers, I hear my mentor's voice in my head saying, 'Well, that's your job. That's actually the job you took when you took on this role, ideally.' I think he's right. A lot of the marketing in small-scale agriculture ends up being very relational and relationship-based. Over the course of building those relationships, you do end up having a voice for your consumers, of being able to offer ideas to change consumption patterns or even suggest certain customers buy a new thing that they haven't bought before."

**Harvest time versus time to harvest.** An interest in harvesting weeds for market juts up against efficiency of harvest. Although weeds do not require nearly as much of an investment as sown crops, the labor costs to harvest still need to be greater than the profit.

Nicole Starosielski: "Edible weeds need to be efficient to harvest. Sometimes, the weeds are scattered among others, or some of the purslane has leaf miner damage and picking through it is really slow. We find that having a big bowl of sumac heads or sending it as part of our CSA offer is part of the diversity and people in our CSA really like that. That's really useful, but only works for us in the later [busiest] season because it's such a low level of processing: go grab them off a tree and then they sit in a bowl. You don't have to do anything to them, you're not even washing them."

Edward Blain: "Some of the farmers who have seen us out picking often comment on how long it takes because we pick everything extremely clean and tidy and harvesting requires a bit more walking and poking around than harvesting something that has been planted in straight rows."

For some wild crops, the numbers between labor cost and profit may never match up to make them economically sensible. For some farmers, non-commercial benefits of offering weeds as crops outweigh economic reasoning.

# SAFETY AND LEGALITY

## LEGAL CONSIDERATIONS

As long as edible wild plants are harvested from land managed as an established farm business and then cleaned, stored and recorded using the processes required for cultivated crops, edible weeds are subject to the same legal requirements and protections as all produce that is sold through commercial channels.

**USDA, FSMA, FD&C, etc**. According to the Produce Safety Alliance (PSA*), wild edibles need to meet the same food safety standards as other vegetables. United States Food and Drug Administration's Food Safety Modernization Act (FSMA) standards (from which many small farms are exempt) address wild harvests in one section only:

*"Under the revised definition of ''farm'' we established in § 1.227, an operation that is devoted only to the harvesting of covered produce grown in the wild is within the ''farm'' definition. We are adopting this definition of farm in § 112.3(c). Because, in this circumstance, the farm is not engaged in the growing of the covered produce, the standards in part 112 relating to growing activities do not apply to such a farm (see § 112.4(a), providing that covered farms subject to part 112 must comply with all applicable requirements when conducting a covered activity on covered produce). However, the harvesting activity and any other covered activities conducted by the farm on covered produce are required to comply with those requirements in part 112 that are applicable. We also expect that a large proportion of such operations (i.e., those that harvest covered produce grown in the wild) may not be covered under this rule (see § 112.4(a)) or may be eligible for a qualified exemption (see § 112.5) based on their size.""*

The bottom line is that wild vegetables are subject to the same federal regulations as vegetables grown from seed. The federal Food Drug and Cosmetic Act (FD&C) still applies if contaminated produce (wild or not) is introduced into commerce and the same recommendations — such as not harvesting produce that has fallen on the ground or shows signs of wildlife activity, picking into clean containers, and frequent hand-washing — apply.

**Organic certification.** According to the Northeast Organic Farming Association (NOFA), edible wild plants harvested from farms for market are eligible for organic certification following the same process as certification for crops grown from cultivated seeds.

**Invasive species.** State environmental departments regulate interactions between people and some plant species that are categorized as "invasive." The primary purpose of such regulations is to minimize further spread of the species in question. Some edible weeds commonly found on farms are defined as invasive species in some states. In New York State, the Department of Environmental Conservation' (DEC) rules state that it is illegal to "possess with intent to sell, import, purchase, transport or introduce a prohibited invasive species." However, a free license permitting such interactions with invasive species can be obtained from the DEC "for research, education or other approved activity." In a phone conversation, DEC representatives shared that their department turns a blind eye when it comes to invasive species sold as food at market. Formally, the regulations apply to species in a "free-living state" and since invasive plants that come to market are unlikely to be in a state to proliferate, the DEC remains unconcerned about this type of transport and sale. A number of Northeast-based foragers whose businesses involve a wide distribution of invasive plants for food have opted to apply for invasive species licenses. No farmers surveyed for this guide have sought this license and none have been questioned by regulatory representatives.

In other words, while regulatory agencies do not encourage the sale of edible invasives as a strategy for curbing their spread, nor do they explicitly oppose their marketing or consumption as food. Still, it's

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**PSA is a collaboration between Cornell University, the Federal Drug Administration (FDA), and the United States Department of Agriculture (USDA) to prepare fresh produce growers to meet the regulatory requirements included in the FSMA Produce Safety Rule.*

important for farmers who engage with invasive plants as food crops to be mindful of the potential for spreading them. When marketing potentially reproductive plant parts - such as fruits, seed, or roots - farmers should instruct customers to boil unused parts of the plants before disposal.

**Plants commonly regulated as invasives in the Northeast that also make a great meal:**

- Autumn olive (*Elaeagnus umbellata*)
- Bamboo (*Phyllostachys spp*)
- Beach rugosa (*Rosa rugosa*)
- Himalayan Blackberry (*Rubus armeniacus*)
- Black locust (*Robinia pseudoacacia*)
- Daylily (*Hemerocallis spp*)
- Garlic mustard (*Alliaria petiolata*)
- Japanese barberry (*Berberis thunbergii*)
- Japanese knotweed (*Reynoutria japonica*)
- Kudzu (*Pueraria spp*)
- Mugwort (*Artemisia vulgaris*)
- Mulberry (*Morus alba*)
- Multiflora rose (*Rosa multiflora*)
- Sheep sorrel (*Rumex acetosella*)
- Siberian elm (*Ulmus pumila*)
- Watercress (*Nasturtium officinale*)
- Wineberry (*Rubus phoenicolasius*)
- Wisteria (*Wisteria sinensis*)

Of the 11 Major Weeds of New York listed by Cornell's Weed Ecology and Management Laboratory, at least four have already appeared at farmers' markets. Of the 183 Nonnative Plant Species in New York State compiled by the Brooklyn Botanic Garden, over 20 are choice edibles.

By promoting the harvesting and eating of "invasive" plants as a form of organic ecosystem management, farmers can raise public awareness of two environmental concerns: 1) Invasive plants that may have detrimental impact on native plant populations, and 2) Extensive chemical applications on private and public land for the purpose of controlling local populations of invasive plants.

## SAFETY CONSIDERATIONS

### RISKY FARM WEEDS:

A few botanical plant families contain both edible relatives (commonly grown vegetables as well as wild foods) and toxic members. In the Northeast, a number of edible agricultural weeds could, at first glance, resemble their dangerous and very inedible counterparts. Farmer-foragers who are just beginning to know their edible weedy neighbors can minimize this risk by avoiding harvesting wild edible plants of the Apiaceae and Solanaceae families entirely until they have gained extensive knowledge and experience with identifying individual species.

**Apiaceae**. Also known as the Carrot Family, Apiaceae species include popular farmed vegetables such as carrots, parsley, fennel, dill, lovage, parsnips, and celery. Notable spontaneous edible plants of this family include Queen Anne's lace (Daucus carota), wild parsnip (Pastinaca sativa) (with caution), cow parsnip (Heracleum maximum), and angelica (Angelica atropurpurea). This family also contains some of the most dangerous and even deadly plants of the region. They include poison hemlock (Conium maculatum), water hemlock (Cicuta maculata), and giant hogweed (Heracleum mantegazzianum).

**Solanaceae**: Also known as the Nightshade Family, Solanaceae species include some of the most beloved farmed vegetables, including tomatoes, potatoes, peppers, and eggplants. One weedy, edible relative is black nightshade (Solanum ptycanthum). Dangerous and toxic relatives throughout the Northeast region include: bittersweet nightshade (Solanum dulcamara) whose fruit slightly resemble small tomatoes; horse nettle (Solanum carolinense); and jimsonweed (Datura stramonium), which has psychoactive properties and can be fatal to humans.

**Caution with Pokeweed**: Pokeweed (Phytolacca americana) does not have dangerous lookalikes as the plant families above, but extra time and patience is warranted when harvesting and consuming pokeweed - especially if the plant will be shared or sold. When prepared improperly or consumed outside of the correct growth stage, this popular wild vegetable can

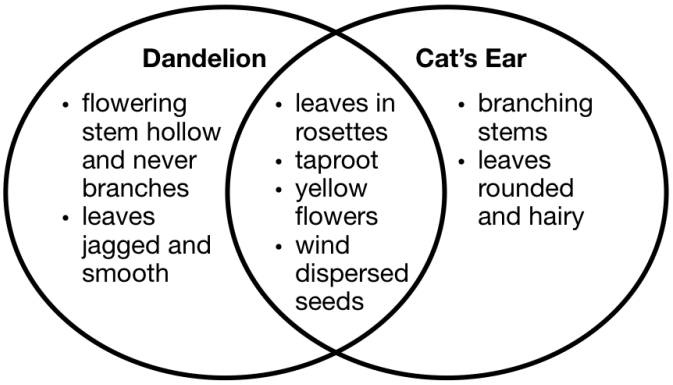
be harmful to health, as it does contain toxic compounds. Although pokeweed is far from the only food wild or cultivated that requires proper preparation to render it safe to eat, it is one of the few edible weedy greens in this category with a strong cultural following and established regional market. Pokeweed is native to North America and has extensive history as an important culinary plant among diverse communities throughout its growing range. In the southern United States, where it is also known as Poke Sallet, it continues to be a celebrated spring green and can be commonly found at farmers' markets.

**Please note that descriptions provided in this guide are not a sufficient source of information for identifying, harvesting, or preparing potentially dangerous plants.**

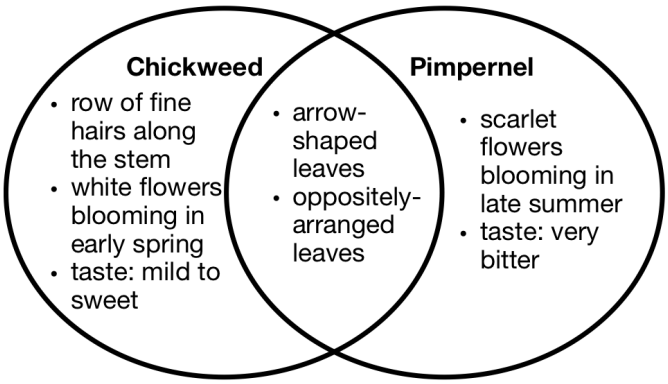
## EDIBLE WEEDS LOOKALIKES:

A few superstar edible weeds can look similar to plants that are inedible, unpalatable, or otherwise undesirable as food.

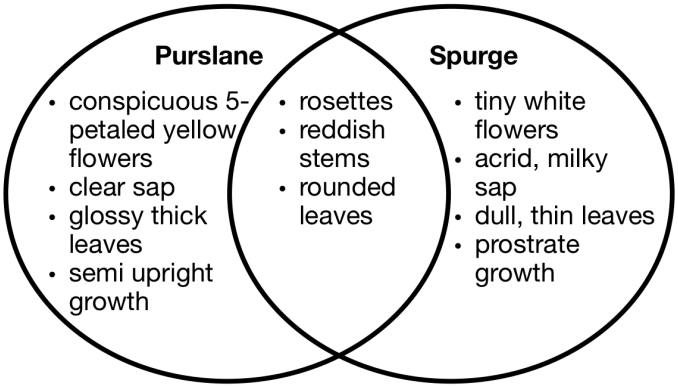
**Dandelions** are in the Asteraceae family and have no poisonous lookalikes; however, at certain life stages, they may resemble a few less tasty relatives. The closest lookalike that also enjoys comparable habitats is cat's ear (*Hypochaeris radicata*). Others that share a familial resemblance include young chicory (*Cichorium intybus*), young sow thistle (*Sonchus spp*) and young wild lettuces (*Lactuca spp*). All species mentioned above are in a clade of the Asteraceae that have distinguishing milky white sap.




**Chickweed** (*Stellaria media* - Caryophyllaceae family) looks similar to a related edible species, mouse-eared chickweed (*Cerastium vulgatum*). Mouse-eared chickweed, however, has hairy leaves and stems, which is a texture most find unpleasant. Chickweed has another unrelated lookalike - scarlet pimpernel (*Anagallis arvensis* - Primulaceae family) - that contains saponins and is likely to cause an upset stomach if eaten.




**Purslane** (*Portulaca oleracea* - Portulacaceae family) can be compared to the prostrate spurge (*Euphorbia supina*) and spotted spurge (*Euphorbia maculata*). Spurges are not edible: they taste bitter and can cause stomach upset if consumed. Purslane's succulent nature, when contrasted with spurge's flattened look, is a key distinguishing feature. Purslane can also look like moneywort (*Lysimachia nummularia*) when both species are in bloom. Moneywort is safe to consume and has a mildly tart flavor similar to purslane.



# THE STORY OF GORZYNSKI "ORNERY" FARM

BY GABRIELLE LANGHOLTZ

Many customers come to Greenmarket for organic ingredients, seeking out that certification on stand signs. But each Saturday at Union Square, the most impassioned ecological eaters can be found buying food from a farm that gave up its organic certification more than a decade ago.

Back in the 1970s, John Gorzynski was a tree surgeon in New Jersey and spent much of his time spraying pesticides to control everything from Dutch Elm disease to gypsy moths. But over the decade he saw his coworkers get cancer. He read Rachel Carson's famous book *Silent Spring*. And he observed, year after year, increased illness in the places that had received the most potent chemical applications.

"I came to see there was a natural system, natural controls," he recalls. "These sprays were disrupting that natural system. I realized it was bad on every possible level." So he quit and, to make a living, turned his hobby garden into a market garden, vowing to never use the kinds of chemicals that he had firsthand seen destroy human health and the wild environment.

In 1979 he started selling at the Gansevoort Greenmarket.

"By 1982 I realized I could make a living, so I bought my own farm and got married. And that's either the end or beginning of the story, depending on how you look at it."

But John wasn't just busy with his own farm. He dedicated decades to raising awareness about the perils of pesticides, educating the public about organic agriculture, and calling upon the federal government to regulate the use of the term to ensure strict standards customers could trust. He was a founding member of the New York chapter of the Northeast Organic Farming Association (NOFA) and was its chairman when it became a certification agency. And he was his county's Farm Bureau president from 1983 to 2001, voicing the concerns of organic farmers in that more conventional arena. "I was trying to be a level-headed person within the realm of chemically addicted people."

For years he and like-minded advocates lobbied for the USDA to create standards governing organic certification, so that Americans anywhere could see that word and know what they were eating was grown without synthetic fertilizers, pesticides, herbicides, or fungicides. And their work finally paid off — in the final months of the Clinton administration, the USDA moved ahead to create a National Organic Program (NOP) regulating certification.

But as Otto von Bismarck famously wrote, to see laws or sausage being made is to lose respect for either. Indeed, John watched in horror as industrial-ag conglomerates had their way in Washington. And when the ink was dry on the NOP, a full 142 synthetic chemicals, from tetracycline to stretramyalin, were allowed in agricultural products bearing the O-word.

"It was like my world came crashing down," says John.

He had lobbied for years for this very law, and was devastated to see exceptions for chemicals that, in his words, "are so destructive to the environment they shouldn't even be allowed in conventional agriculture, let alone organic." (Allowing those 142 chemicals, by the way, is just one of sixty-three issues to which farmers like John so ardently object.) As he saw it, the certification he'd dedicated much of his life to building was now so lax that it was effectively meaningless.

It took almost a year to come to grips with, but after twenty years of being certified organic by the state, the Gorzynski family decided to give up the term rather than participate in a certification they could no longer stand by. Still, while so many organic brands are owned by Dean Foods, General Mills, Hershey, Con-Agra, Cargill, Pepsi, and Hain-Celestial, John still believes in the kind of agriculture for which he no longer has an easy adjective. And while he's legally not allowed to answer in the affirmative when customers ask if his farm is organic, he finds that most are more than happy with his complicated answer.

"I explain that I was certified for twenty years and that organic certification now allows 142 synthetics, and I don't use any of them. That I don't own a spray rig. And that my farm uses nothing but seeds, sun, soil, and water."

And in the end, most customers come to realize that the one word they were looking for is actually an inadequate stand-in for exactly what they get at the market — the chance to meet the farmers themselves and have a face-to-face conversation about how their food is grown.

It's clear that John's customers value his honest food more than any federal certification. When his not-organic farm suffered floods, this concerned community ponied up donations, even demanded that he raise prices. After thirty years selling at Union Square, he sees not only his customers' kids growing up, but now grandkids too. And customers who have moved away still visit when they're passing through New York, showing pictures of their families and asking after his.

His crops have grown up too. When he first came to Greenmarket back in 1979, customers had never seen sugar snap peas, delicata squash, or a head of red lettuce. "People were like, 'Oh my God, what is that?'" laughs John. "Their base of food knowledge was so limited. But today it's grown beyond anybody's expectations. Within a lifetime to see the number of wild foods available — purslane, dandelion, calalloo, nettles, lambs quarters. When I first started, all the other farmers would make fun of me for the weeds on my table. But the nutrients in those wild things are so superior, up to nine times the nutrients of cultivated crops. To have helped widen horizons so much within my lifetime is wonderful."

He now grows about 600 varieties of vegetables and 300 of fruit — including well over 100 varieties of lettuce alone. And he saves the seeds for many crops crossed right on his farm: parsnips, burdock, mustard greens, spinach, beets, and a particular leek he's been saving for decades. And while his apples next to shiny supermarket specimens look like a seasoned boxer alongside a made-up model, John says he's growing for flavor, not cosmetics. "They look like apples are supposed to look, and they taste like apples are supposed to taste."

Still, there's the semantic matter of how to describe the way he farms. He sometimes uses terms such as permaculture or nutrient dense or petrochemical- free. But back in 2000 when the family decided to drop certification, John's wife's license plate read "GO Farm," an exhortation that riffed on the name Gorzynski Organic Farm. "We needed another O word," John says. They landed on one that felt exactly right.

"'Ornery' was just so easy. It was exactly how I felt about the government grab. And I continue to be ornery to this day when it comes to that. But otherwise I enjoy life. Ninety percent of my crops are thriving. The word 'organic' in this country is greatly diminished. But I continue to stand here and be ornery and do what I do, which I'm proud of."

*This story is excerpted from The New Greenmarket Cookbook, by Gabrielle Langholtz and available from DA CAPO PRESS/ Lifelong Books.*

# CHAPTER NINE

# COMMUNITY SERVICES OF EDIBLE WEEDS

Edible weeds are weavers of a vast cross-cultural fabric. Their ubiquity on disturbed soils across the planet has empowered them to grow long-standing and rich relationships with diverse peoples. In addition to being dismissed as nuisances - or, instead, valued as marketable crops - edible weeds can also offer a near-forgotten taste of home, a welcome connection between seemingly disparate backgrounds, a vessel for sharing cultural stories and, simply, a reason to come together in gratitude for the generosity of the land.

This book only scratches the surface of the kinds of stories that are shared between weeds and people. The world contains so many more voices, voices who never called a wild plant a weed, people who never needed convincing that all plants belong and carry intrinsic value as beings living in the world - not just as servants for human dreams. This chapter is a small celebration of opportunities for uplifting such voices, interacting with wild plants on farms in ways that move communities toward respectful relationships with all plants, finding humble actions for responsible stewardship, and enacting care for the land by participating in eternal cycles of reciprocity between all beings living and dying on Earth.

Farmers, as land stewards, are well-positioned to facilitate some reciprocal interactions by opening their land to gatherers and gatherings. Here are a few examples of how edible weeds grow community:

## BOTANICAL COLLABORATIONS

Eileen Wallding and Nicholas Pandjiris of Whistle Down Farm, a diversified vegetable and berry farm (Claverack, New York), open their land to the Wild Gather School of Herbal Studies. The school, led by Mandana Boushee and Lauren Giambrone, hosts seasonal classes in the field using the farm's edgelands and field weeds to share teachings about Northeastern medicinal plants. Over the years, Wallding and Pandjiris have opened their land to many others who work with weedy plants, including culinary foragers, herbal medicine makers, and honeybees and their keepers.

Avery McGuire and Edward Blain forage the majority of wild foods for their company, Thalli Foods, on over a dozen organic farms in New York's Finger Lakes region. Blain and McGuire have made varied arrangements with farmers. Some farmers allow them to forage on their land in exchange for occasional informal lessons about wild foods, others invite foraging in exchange for occasional farm help. Blain and McGuire have also experimented with harvest and profit sharing arrangements, although these proved more complicated than they were worth because of the small scale of their business.

Dina Falconi (Hudson Valley, New York), a clinical herbalist and author of *Foraging and Feasting* (among other books), has been teaching classes about the use of plants for food, medicine, and pleasure for more than 20 years. According to Falconi, the most abundant foraging grounds are on organic farms that aren't "well kept," and that encourage collaborations between farmers and foragers.

"It feels like it's a partnership that's made in heaven," says Falconi. "I know the farmers get agitated or distressed because they have a specific, clean image of their row of whatever they are growing and, sometimes, it's true, you need to weed. But, a lot of the time, plants can coexist, of course, depending on what the goals of the farm are. There's a huge place where organic farmers can embrace edible weeds and make sense of them. There is so much abundance that grows between the rows. A balance needs to be figured out, when it becomes too much and squeezes out the cultivated plants, but the reflex to always weed out everything but what your crop is - that's craziness! There is a huge amount of food and medicine that's so easy to gather. Maybe in the future, farmers are working with foragers who come in and tend their landscape basically by weeding but using the weeds. I

always tell people to do that: go find your organic farmer and help them. They'll be happy and you'll come back with bagfuls of food.

So, it's a cultural thing too. If the farmer wants to control things, they can bring in people to help reap the benefits of what the land is offering. A lot of times, people don't use what is all over. You can bring the community in for a dandelion day to dig dandelions. Come on, here you have your gift - let's celebrate! When the dandelion blossoms are particularly strong, a farm could have a dandelion festival with whatever rituals you like around it, or with just eating and picking them for wine. It's bringing that back to celebrate what was lost. When a neighbor looks over to another neighbor's lawn and sees lots of dandelions, they give them the evil eye instead of saying, "Oh my god! Gorgeous!" This cultural weaving of different perspectives can shift based on how we celebrate. The whole goal of Foraging and Feasting [book] was to celebrate."

One farmer taking Dina's advice to heart is Blake Arrowood, who hosts an annual dandelion harvest at Arrowood Farm and Brewery. In May, when dandelions are in bloom, Arrowood puts out an invitation for a public dandelion harvest day. People are invited to harvest blossoms from the wide, mowed rows in the farm's hops yard, then invited to sell bags of dandelions to the brewery in exchange for a pint of beer. "We had an overwhelming response," says Arrowood. Many children participate in the harvest and the day is presented as a collective celebration of this early spring plant. "There are these couple of weeks in spring time when the field is yellow it's just beautiful. When you galvanize the public and make it fun, it's a totally different experience [of weeds]." The farm benefits by exchanging pints for a desirable but labor-intensive ingredient used in the brewery's Dandelion Saison beer.

Another example of a celebratory collaboration between foragers and farmers is Hayden Stebbins' "Forage and Feast" event series. Stebbins is an ethnobotanist and functional herbalist (Brooktondale, New York) who focuses on plants as medicine and as food, as well as on their role in the environment and the interplay between people and plants. Among his many activities, Stebbins organizes foraging events on farms throughout the Northeast. During the Forage and Feast events, participants "learn about common introduced and native plants, how to identify them by family, and their edible, medicinal, or poisonous properties." During the guided walk, the group harvests edible plants, which they then bring back to the farm kitchen where, combining wild ingredients with cultivated foods, they prepare and eat a multi-course meal together. Stebbins has had various arrangements with the host farmers. "The exchange depends on the farm," Stebbins explains. "Sometimes, they [farmers] get a part of ticket sales, and sometimes they just host for publicity and sell their products that day."

These are just a few of the many kinds of collaborations that exist between foragers and farmers. Many are informal, more relational than lucrative, created more to strengthen plant-respecting communities than to grow a business.

## HARVESTING FOR ECOSYSTEM BALANCE

One creative idea that has come out of the invasive species dilemma is the "invasivore" campaign. The idea originated as a way to reduce invasive species populations by harvesting them for food. "If you can't beat them, eat them," was one of the movement's early slogans. The concept of eating an ecosystem back into balance has since received criticism (from scientists and land management agencies) for a few reasons. The primary argument is that to make any impact on "invasive" plant and animal populations long term would require repeated harvests on a massive scale.

However, community harvests of abundantly growing plants have many other positive benefits to offer. Such harvest can be a venue for raising public awareness about which species are moving into a habitat, which are moving out, and which human behaviors affect those flows. Moreover, this approach can help highlight positive interactions between

people and invasive species - a perspective that is often silenced in invasive species management policies. It is a way to use the botanical gifts that are abundant in the landscape while at the same time (hopefully) diverting an interest in wild foods away from species whose populations cannot be sustained under pressure of large harvests from many foragers. Such harvests need not be reserved for culinary purposes. Many "invasives" are also powerful sources of medicine (Japanese knotweed, barberry, and purple loosestrife are examples) and others make excellent material for building (black locust), garden amendments (Japanese knotweed), biomass (phragmites), and crafting (kudzu, grapevine, english ivy, reed canary grass).

Farmers with large, accessible stands of species categorized as invasive can open their land to the community for such ecologically-minded harvests.

## CROSS-CULTURAL CONNECTIONS

As mentioned in the previous chapter, wild foods, especially weedy wild foods that grow in gardens across continents, can be a common point of connection for diverse cultures from different sides of the planet. They can strengthen inclusive community relations by highlighting cross-cultural, culinary narratives.

Salt City Harvest Farm, for example, organizes an incubator farm and community growing space for refugees and New Americans from Bhutan, Somalia, Nepal, Eritrea, and Burma. When the initial cohort of farmers came to the farm, they quickly began harvesting the land's robust population of familiar edible weeds, bringing food traditions from their home cultures to Syracuse, New York. Sharing cultural identities and heritages in a new and unfamiliar locale has been fueled, in large part, through an exchange of weedy species that people across disparate cultures and languages all recognize from their homelands. Weedy cross-cultural collaborations at Salt City have only grown since that first season. Last year, the farmers harvested nearly 300 pounds of weeds for community consumption and sold another 300 at the regional farmers' market. The diverse, culinary creations using wild ingredients prepared by Salt City farmers also helped inspire a series of community pop-up dinners where neighbors shared cultural foods and food stories with one another. Finally, the weedy harvests aided in establishing the "New American Farm Share" - a CSA option that incorporates edible weeds and cultivated crops important to the home cultures of New Americans.

*Farmers harvesting wild greens amid rows of peppers at Salt City Harvest Farm*

## BIOCULTURAL RESTORATION

Farmers throughout the country are joining a growing movement to restore justice to the land. In 2018, two farmers in Nebraska returned a portion of their land, which sits within the Ponca peoples' ancestral territory, back to the Ponca Tribe. In 2017, a farmer in California returned a portion of his land to its ancestral stewards: the Kashia Band Pomo Tribe. In the Northeast, just last year, Oneida Nation of the Haudenosaunee Confederacy successfully recovered a small portion of their ancestral homelands when a

private landowner gifted her land to the Oneida Nation. This land return was particularly significant because some of the ancestral territory of Oneida peoples was originally stolen because the area was especially desirable for agriculture. Across the continent, native peoples and allies are beginning to use the tools of conservation to restore biocultural relationships. Native land trusts, for example, are emerging as powerful instruments for restoring land sovereignty.

Soul Fire Farm (Grafton, New York), is a Black, Indigenous, people of color (BIPOC) centered community farm that is "committed to ending racism and injustice in the food system." The Soul Fire team brings "diverse communities together […] to share skills on sustainable agriculture, natural building, spiritual activism, health, and environmental justice." They are "training the next generation of activist-farmers and strengthening the movements for food sovereignty and community self-determination." One of the ways Soul Fire is advancing sovereignty and self-determination is through the Reparations Map for Black and Indigenous Farmers, an interactive, digital map which aims to catalyze voluntary transfer of farmland, agricultural resources, and money to BIPOC farmers. Farmers of color list their land or resource needs on the map, enabling them to connect with those who have access to land or financial resources and want to participate in this type of direct people-to-people reparations.

What do such biocultural justice collaborations have to do with weeds? The work of biocultural restoration and land justice takes many forms. It does not always look like a title change. It is about restoring relationships between land and its people, and rebuilding good relations between people. Some wild plants that have come to be known as weeds in the dominant discourse have great cultural significance for Native communities with which those plants have shared a home since time immemorial. Some so-called weeds occupy respected places in Indigenous pharmacopeias, regardless of whether they are species that first moved to this continent with settlers or have always lived here. Beyond valuing individual species, the practice of tending to and harvesting wild plants is, for some indigenous peoples, an integral way of carrying forward culture and language, and fulfilling their responsibilities to the land. Traditional Ecological Knowledge (TEK) is carried through the generations by land-based practices such as hunting, fishing, or gathering plants for food and medicine. TEK has many meanings to many people. A broad, working definition compiled by the US Fish and Wildlife Service explains that TEK:

*"refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways, including but not limited to hunting, fishing, trapping, agriculture, and forestry. TEK is an accumulating body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (human and non-human) with one another and with the environment. It encompasses the world view of indigenous people which includes ecology, spirituality, human and animal relationships, and more."*

Dr. Robin Wall Kimmerer, a plant ecologist and author who teaches extensively about traditional ecological knowledge, explains that TEK "is born of long intimacy and attentiveness to a homeland and can arise wherever people are materially and spiritually integrated with their landscape."

Some farmers who own land are in a position to return opportunities to practice traditional ecological knowledge to native communities through customary use easements or usufructuary rights agreements. Unlike returning land in full, these types of legal agreements allow access to land for specific purposes or for certain communities. Such agreements can and do exist on privately owned lands and are also made between state and tribal governments on public lands. Two regional resources for thinking through such partnerships are the New England Farmers of Color Land Trust (Northeast) and First Light Learning Journey (Maine). Another potential starting point for considering such agreements is to connect with a local land trust.

# PART THREE

# LEARNING

# ID GUIDE: MEET THE WEEDS

## IN-ROW ANNUALS:

Amaranth

Burdock

Chickweed

Dandelion

Lamb's quarters

Purslane

Field sorrel

## PERENNIALS ON THE EDGE:

Autumn olives

Garlic mustard (biennial)

Japanese knotweed

Mugwort

Sheep sorrel

Stinging nettles

Sumac

## AMARANTH

**Scientific name**: *Amaranthus* species, including *A. retroflexus, A. palmeri, A. hybridus, A. powellii*

**Common name(s)**: Amaranth, Pigweed, Callaloo

**Description:** Amaranths vary in size and appearance by species and growing conditions, but commonly harvested species are three to ten feet tall herbaceous plants with simple, alternately arranged, oval shaped leaves that are dark green to purple in color. Flowers are tiny, inconspicuous, in dense, green clusters at the terminal tips of stems. Amaranth produces an abundance of shiny, black, spherical seeds that stay viable in the soil for around five years.

Amaranth is an ancient food native to Mesoamerica. Amaranth has a rich culinary history around the world, and is especially beloved in cuisines across Mexico, Central America, and the Caribbean. As one of the few greens that thrives in dry, hot weather - amaranth is held in special esteem by Southwestern desert communities.

**Edible season**: mid-summer greens; early-autumn grains

**Culinary uses:** cooking green similar to spinach, can be eaten fresh but texture is fibrous, grain similar to quinoa

**Nutrition**: Greens are high in calcium, niacin, iron, vitamins A, C. Grain is rich in protein, fiber, and vitamins A, C.

**Habitat preference**: disturbed, rich soils

**Sun/shade**: full sun to partial shade

**Reproduction:** by seed only, need high temperature and sunlight to germinate; germination will continue through summer if conditions are right

**Root structure:** long, often reddish taproot and fibrous

**Growth cycle**: annual

## CHICKWEED

**Scientific name**: *Stellaria media*

**Common name(s)**: Chickweed

**Description:** Petite, clumping plants with bright green, oppositely arranged leaves and small flowers with five deeply-divided petals. Stems are prostrate, swollen at nodes, lined with fine hairs and stretch when pulled.

**Edible season**: early spring greens, early-autumn greens

**Culinary uses:** versatile greens great raw or cooked, mild, lettuce like flavor; leaves, stems, and flowers are edible

**Nutrition**: rich in beta-carotene, ascorbic-acid, calcium, iron, niacin, magnesium, potassium, riboflavin, selenium, thiamin, zinc, copper, Gamma-linolenic-acid, phosphorus, sodium, silica, and vitamins A, C, D

**Habitat preference**: disturbed, nitrogen rich, moist soils

**Sun/shade**: shade tolerant

**Reproduction requirements:** by seed or stolon

**Root structure:** shallow and fibrous

**Growth cycle**: winter annual

## DANDELION

**Scientific name**: *Taraxacum officinale*

**Common name(s)**: Dandelion

**Description**: Leaves arranged in rosettes and very variable in shape and size, deeply lobed (often with pointed tips reminiscent of sharp teeth). Flower stalks are hollow and leaf-less, with a highly-petaled yellow flower (technically - flowers - see Asteraceae family). Mature seeds are attached to tiny, parachute-like structures (pappus) that are arranged in a sphere around the flower head.

Dandelion origins are debated, but there is no question that these hardy plants have naturalized across the planet. They have extensive use in cuisines and pharmacopeias on at least five continents: North and South America, Europe, Asia, and Africa.

**Edible season**: early spring roots, followed by greens, followed by flowers; autumn greens followed by roots

**Culinary uses:** versatile greens great raw or cooked, bitter like Italian cooking greens. Flowers sweet and mild, roots rich, savory-sweet with hints of dark chocolate

**Nutrition**: extremely high in beta carotene, high in fiber, calcium, iron, riboflavin, lutein, folate, niacin, magnesium, phosphorus, potassium, and vitamins A, B6, E, K

**Habitat preference**: anywhere soil is disturbed

**Sun/shade**: full sun to partial shade

**Reproduction:** wind-dispersed seed

**Root structure:** deep taproot

**Growth cycle**: perennial

## LAMB'S QUARTERS

**Scientific name:** *Chenopodium album*

**Common name(s)**: Goosefoot, Bathua, Quelites, Pigweed, Fathen, Wild spinach

**Description**: Herbaceous green with smooth, grooved stems growing two to three feet tall. Alternately arranged leaves are variable but often shaped like foot of a goose, with coarsely toothed margins, and covered in a chalky white coating,

especially on the leaf underside. Small, green flowers are inconspicuous and born in the leaf axils at the top portion of the stem. The plant produces an abundance of tiny seeds each season.

Lamb's quarters are closely related to quinoa and in the same family as spinach and beets. Their history of cultivation in North America pre-dates maize agriculture.

**Edible season**: summer greens, early autumn grains

**Culinary uses:** raw or cooked, although most prefer cooked due to the chalky texture of raw leaves, similar to spinach; grains cooked like quinoa

**Nutrition**: one of the most nutritious greens ever analyzed. Great source of fiber, protein, niacin, folate, iron, magnesium, phosphorus, thiamin, riboflavin, calcium, potassium, copper, and manganese and vitamins A, C, E, and B6

**Habitat preference**: prefers disturbed soils with high organic content

**Sun/shade**: full sun to partial shade

**Reproduction:** by seed only, need high temperature and sunlight to germinate; germination will continue through summer if conditions are right

**Root structure:** deep taproot

**Growth cycle**: annual

## PURSLANE

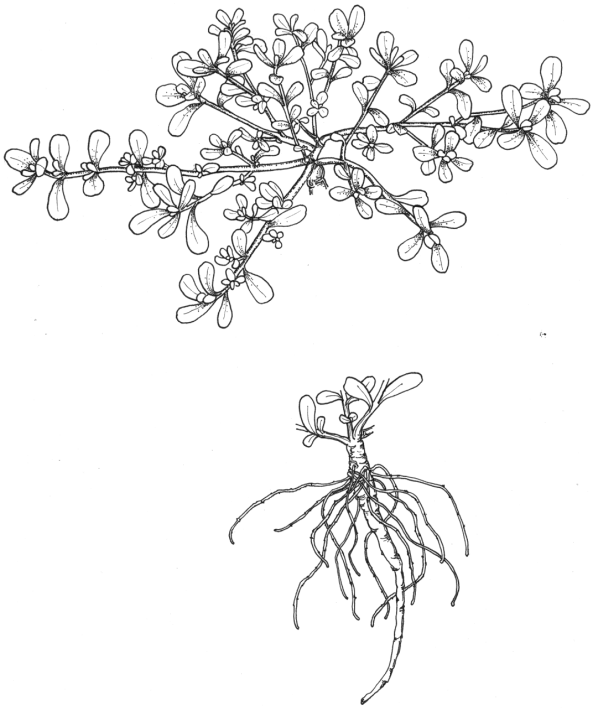
**Scientific name:** Portula oleracea

**Common name(s)**: Purslane, Verdolaga, Pusley

**Description:** Low growing rosettes up to two feet in diameter with reddish, smooth stems and alternately arranged leaves. Leaves are dark green or reddish, succulent, flat, rounded and more numerous at the branch tips. Flowers are yellow, five-petaled, usually occurring in the axils at branch tips.

Purslane is a cultural keystone weed, beloved in diverse cuisines worldwide. In the United States, purslane has gained recent popularity as one of the few rich, plant-based sources of Omega 3s.

**Edible season:** late spring and mid-summer greens



**Culinary uses:** raw or cooked greens are slightly tart and mucilaginous; stems are an excellent texture for pickling

**Nutrition**: high in Omega 3 fatty acids, rich source of beta carotene, magnesium, calcium, iron, riboflavin, potassium, phosphorous, manganese, and vitamins A, C, E

**Habitat preference**: prefers disturbed soils with high organic content

**Sun/shade**: full sun

**Reproduction:** by seed and adventitious roots, seeds need high temperature to germinate; germination will continue through summer if conditions are right

**Root structure:** tuberous taproot and secondary fibrous roots

**Growth cycle**: annual

## FIELD SORREL

**Scientific name:** Oxalis stricta

**Common name(s)**: Wood sorrel, Oxalis, Sour grass

**Description:** Rarely growing taller than one foot, field sorrel has three-lobed leaflets that, at first glance, resemble clover, but are distinguished in that each one is shaped like a heart. Leaves range from light green to reddish-purple. Five-petaled yellow flowers give way to distinct, upward facing seed capsules.

Field sorrel folds its leaves up at night and during periods of heat stress.

**Edible season:** mid-spring through late summer greens

**Culinary uses:** raw or cooked greens, flowers and immature seeds are very tart

**Nutrition**: high in oxalic acid - caution should be taken for those with sensitivity; good source of vitamins A and C

**Habitat preference**: disturbed, moist soils

**Sun/shade**: full sun to full shade

**Reproduction:** by seed

**Root structure:** shallow, fibrous

**Growth cycle**: annual

## AUTUMN OLIVES

**Scientific name:** *Elaeagnus umbellata*

**Common name(s)**: Autumn olive, Silverberry

**Description:** Deciduous shrub with alternately-arranged, oval shaped leaves that are covered with silvery scales on the underside, giving the leaf a shimmery appearance. Extremely fragrant yellow-white flowers in late spring give way to crimson berries speckled with silver dots at the end of summer.

Autumn olives are originally from temperate Asia and have naturalized through eastern North America. They are considered invasive in many states. Elsewhere, they are planted in waste reclamation sites as they prevent erosion and fix soil nitrogen. The flowers are an important source of nectar for

pollinators and the shrub itself is an important habitat for various birds.

**Edible season:** early autumn

**Culinary uses:** berries raw and cooked; seed is also edible, albeit chewy

**Nutrition:** rich in lycopene, beta carotene, lutein, and vitamin C

**Habitat preference**: disturbed, nutrient-poor, dry sites

**Sun/shade**: full sun to partial shade

**Reproduction:** primarily by seed but also root-crown sprouting

**Root structure:** spreading

**Growth cycle:** perennial

## GARLIC MUSTARD (BIENNIAL)

**Scientific name:** *Alliaria petiolata*

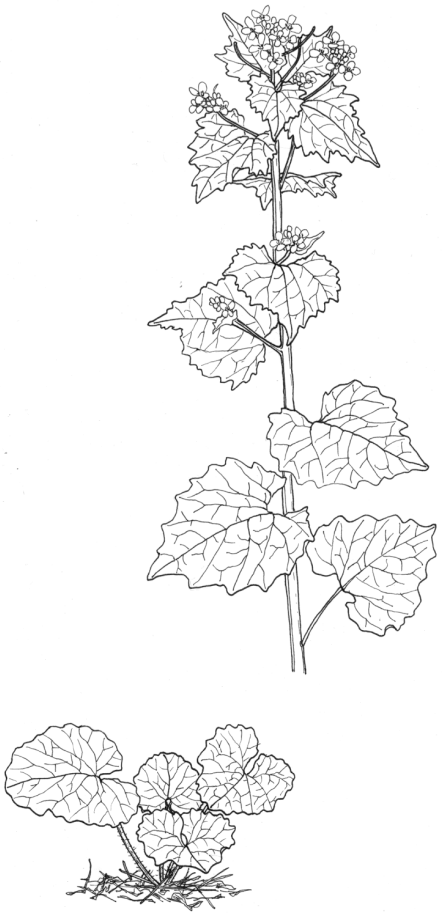
**Common name(s)**: Garlic mustard

**Description:** Biennial relative of the Brassicaceae family, in the first year, garlic mustard grows a rosette of rounded, wrinkled, dark green leaves and a deep, white taproot. In its second spring, the plant sends up a flowering stalk that can grow up to three feet tall and has alternately arranged triangular shaped leaves and small, white, four-petaled, cross-shaped flowers. Seeds mature in thin, long capsules along the stalk and open longitudinally when ripe.

Garlic mustard is originally from temperate Asia and northern Europe, but now grows throughout North America, where it is considered invasive in many states. One of the ecological concerns with garlic mustard is that is extremely shade tolerant and can grow in thick stands in the forest understory. It is one of the oldest known greens eaten in Europe and was first introduced on this continent as a food and medicine.

**Edible season:** early spring roots and greens, mid spring shoots and flowers, summer seeds, and late autumn leaves and roots

**Culinary uses:** raw or cooked greens, broccoli-raab-like shoots, and flowers; seeds ground up or pickled



as mustard seasoning; roots pickled as horseradish substitute

**Nutrition**: contains calcium, magnesium, potassium, selenium, iron, copper, manganese and is especially high in vitamins A, B, C, and E

**Habitat preference**: disturbed forests and field edges

**Sun/shade**: full shade

**Reproduction:** by seed

**Root structure:** deep taproot

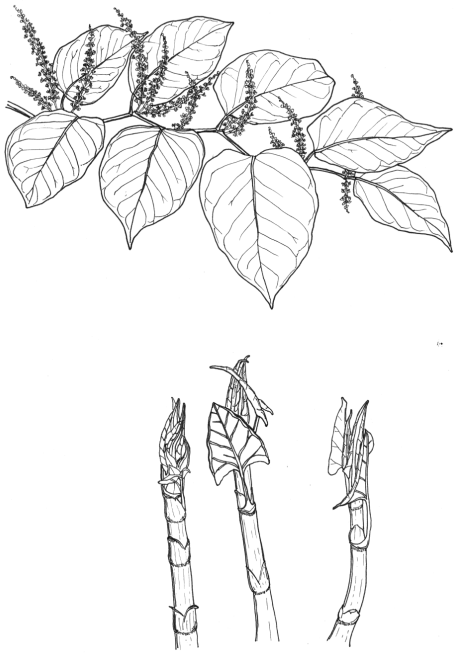
**Growth cycle:** biennial

## JAPANESE KNOTWEED

**Scientific name:** *Reynoutria japonica*

**Common name(s)**: Asian Knotweed, Bamboo

**Description:** A large, colony-forming, herbaceous perennial, Japanese knotweed has speckled, often reddish, hollow stems with raised nodes where the



leaves join. Leaves are large ovals, with smooth margins and a truncated base. Flowers are white, abundant, very fragrant, blossoming in late summer from the leaf axils towards the top of the stems. In spring, knotweed first emerges as small, often pink, shoots, with minute leaves folded flat against the stem.

Japanese knotweed is originally from eastern Asia and has naturalized in Europe and North America, where it is considered invasive. First introduced as an ornamental planting, knotweed has since escaped cultivation and established extensive populations in many places, especially riparian areas. Knotweed grows quickly and powerfully and has been known to come through house foundations. The flowers are an important late-season nectar source. In Japan, where it is native, knotweed shoots are a celebrated spring delicacy.

**Edible season:** early spring roots

**Culinary uses:** raw or cooked; very similar to rhubarb in flavor and application, down to the thin, stringy skin

**Nutrition:** especially high in resveratrol, good source of phosphorous, potassium, zinc, and vitamins A and C

**Habitat preference:** disturbed forests with moist soils, riparian areas, roadside, disturbed wet areas

**Sun/shade**: partial shade to full sun

**Reproduction:** primarily vegetative, most seed is sterile

**Root structure:** two-thirds of knotweed biomass is in the extensive rhizomatous network of long, woody roots

**Growth cycle:** perennial

## STINGING NETTLES

**Scientific name:** *Urtica dioica*

**Common name(s)**: Stinging nettles

**Description:** Herbaceous, colony-forming perennials, growing up to seven feet tall. Nettle leaves are highly toothed, pointed at the tip, and oppositely-arranged

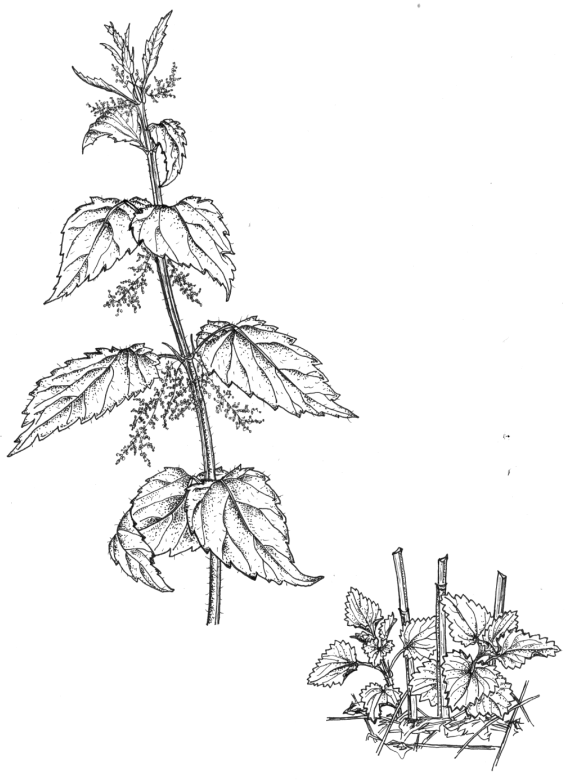
along the stem. Plants are dioecious, bearing inconspicuous green flowers from the leaf axils.

Nettles are famous for stinging skin upon contact. The stinging sensation comes from tiny hypodermic needles which cover the leaves and stem and inject histamines into skin when touched at the right angle.

*U. dioica* is native to Europe and naturalized in eastern North America, however native nettle species also grow on this continent. Nettles have extensive ethnobotanical history as food, medicine, craft material, and soil medicine in North America, Europe, and Asia.

**Edible season:** early spring through mid-spring greens; seeds in summer; second flush of greens in autumn

**Culinary uses:** special caution must be taken to prepare nettles as they contain stinging needles that need to be deactivated. Needles are flattened by being exposed to heat, processed in a blender, or dried.



**Nutrition**: nettles are nutritional powerhouses, especially high in protein, fiber, potassium, calcium, magnesium, iron, and vitamins A, and B6

**Habitat preference**: disturbed, moist soils

**Sun/shade**: full shade to partial shade

**Reproduction:** stolons and seeds

**Root structure**: extensive rhizomatous network plus netlike fibrous roots

**Growth cycle**: perennial

## SUMAC

**Scientific name:** *Rhus typhina (R.glabra similar)*

**Common name(s)**: Sumac, Staghorn Sumac

**Description:** A deciduous, dioecious, shrub that can grow up to 30 feet tall. Staghorn sumac stems are covered in thick rust-colored hairs, which are reminiscent of deer antler velvet. Leaves are alternately arranged, compound with narrow, pinnately-arranged leaflets and serrated margins. Leaves turn various, brilliant colors in autumn. Flowers are yellow-green in dense, terminal, brush-shaped clusters, giving way (in female plants) to bright red, hairy clusters of small, hard berries.

**Edible season:** berries in mid-summer through autumn

**Culinary uses:** berries are covered in tart malic acid, which makes them great in any application where tart flavors are desired. Sumac tea and sumac dried seasoning are two well-known preparations

**Nutrition:** high in dietary oil, calcium, potassium, four rare anthocyanin antioxidants, and vitamins C

**Habitat preference:** disturbed, nutrient poor, dry sites

**Sun/shade**: full sun to partial shade

**Reproduction:** root sprouting, seed

**Root structure:** shallow and wide-spreading

**Growth cycle**: perennial

# RECIPES FOR MARKET

# **AMARANTH CRACKERS** - RECIPE BY MARIAH GLADSTONE OF INDIGIKITCHEN

Amaranth is one of the few plant foods that is special enough to be a complete protein. These crackers are delicious by themselves, dipped in hummus or roasted red pepper sauce, or eaten with cheese. Additionally, they can be kept for a couple weeks without going stale.

- 1 cup amaranth seeds
- 3 cups water
- 3 tbsp. chia seeds
- Pinch salt
- 1 tablespoon sunflower oil

1. Cook the amaranth and water in a medium pot over a high flame. Bring to a boil, reduce the heat and simmer until the amaranth becomes sticky and forms a thick dough.

2. Stir in the sunflower oil and chia seeds and allow to cool.

3. Preheat oven to 300°F. Line a baking sheet with parchment and lightly grease or use a silicone mat. Working with a teaspoon, put small mounds of the dough onto the prepared baking sheet and lightly flatten with your hands until they are as thin as possible, about ⅛ inch. Bake until firm, about 1 hour. Allow to cool thoroughly before removing.

(Alternatively, shape little patties as thinly as possible and set in a food dehydrator. Dehydrate until very crisp.)

Makes about 24 crackers

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# **WILD RICE OMELET** - RECIPE BY MARIAH GLADSTONE OF INDIGIKITCHEN

Wild rice was traditionally eaten by Indigenous nations living around the Great Lakes region. A grass that grows it wetlands, the grains were harvested by canoe and parched by wood fire. While not a true rice, it is cooked in the same way, though typically uses a 4:1 water to rice ration, swelling much larger than a brown rice. This is the perfect recipe when you have too much leftover wild rice from the night before. Any wild green can be substituted in this recipe, though my favorites are lambs quarter and nettles.

- 1 + 1 tsp avocado oil, divided (substitute sunflower or olive oil)
- 1/4 cup lambs quarter raw
- 2 eggs
- 2 tbsp water
- salt & pepper to taste
- 1/4 cup wild rice cooked
- 1/4 cup shredded cheddar cheese (optional)

1. Add 1 tsp of oil to 6 to 8-inch nonstick omelet pan or skillet and cook lambs quarter on medium heat until wilted. Remove from heat and set aside.

2. In small bowl, mix eggs, water, and salt and pepper

3. Add remaining oil to skillet over medium-high heat until hot. Tilt pan to coat bottom. Pour in egg mixture. Mixture should set immediately at edges.

4. If using cheese, add half of the shredded cheese to half of the omelet. This ensures that it melts.

5. When top surface of eggs is thickened and no visible liquid egg remains, place wild rice and spinach on the cheesy side of the omelet and top with remaining cheese. Fold omelet in half with spatula.

6. Slide omelet onto plate and serve immediately. This omelet is delicious by itself or with hot sauce or salsa.

Servings: 1

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# **SUMAC GRANOLA** - RECIPE BY MARIAH GLADSTONE OF INDIGIKITCHEN

Like any granola, this recipe is great for breakfast or snacking. Sunflower, pumpkin, and chia seeds combine for a meal that is high in protein and rich in omega-3s.

- 2 cups rolled oats
- 1/2 cup raw sunflower seeds
- 1/2 cup raw shelled pumpkin seeds (pepitas)
- 1/4 cup chia seeds
- 2 teaspoons sumac
- 1/4 teaspoon salt
- 1/4 cup sunflower oil (can substitute avocado or olive oil)
- 1/4 cup maple syrup

1. Preheat the oven to 300F and line a large baking sheet with parchment paper.

2. In a large bowl, mix the oats, sunflower seeds, pumpkin seeds, chia, sumac, and salt. Add the oil and maple syrup, then use your hands to mix until the dry ingredients are fully coated.

3. Transfer the granola mixture to your prepared baking sheet and wet your hands lightly to spread it into an even layer. Bake for 40-45 minutes, or until golden. Watch the color because granola won't be crisp when you take it out. It will crisp up as it cools.

4. Once the granola is completely cool, break it apart and store in a sealed container for up to a week on the counter, or a month in the refrigerator.

Servings: 10

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*illustration: Eileen Wallding*

## DANDELION - BY MALLORY O'DONNELL

The humble dandelion may well be the iconic wild food plant, prized as an edible and medicinal weed by generations of grandmothers, despised by generations of farmers. Ironically, it is one of the few weedy plants that is regularly farmed and sold as well. Its nutritious benefits are many, but its bitterness puts off our modern palates, accustomed as they are to excessive sweetness. The sharp flavor of this plant can be tempered in many ways, but the most effective and nutritious is simply to combine it with other, milder greens. Another method is a quick drop in boiling water. Some nutrients will be lost, but a greater quantity of the plant can be consumed with ease. And of course, the sooner you collect these leaves once they appear the milder they will be.

The traditional European method of collecting dandelion is to cut the plant just slightly below the crown, leaving the majority of the root in the ground so that a new set of leaves will emerge. In some cases, however, you will want to collect the whole plant, and the root itself should not be ignored. A common use for it is to be roasted and ground and made into a dandelion "coffee," quite similar to the Creole chicory root coffee. While this is quite enjoyable I like to grind the roasted roots and combine with salt to make a savory seasoning salt. It has an earthy, mushroomy flavor and adds depth and umami to soups and stews, or can be sprinkled on finished dishes. Consuming the roots themselves is also quite delicious, I cut them into long slices or leave whole (no need to peel if they come from clean soil) and combine with other root vegetables for roasting. While they are quite strong on their own, in combination with carrots and potatoes and turnips and so on they add an extra depth of flavor without becoming overpowering.

### Dandelion-Chickweed Pesto

**Combine:**
1 cup dandelion greens, washed and dried
1 cup chickweed, washed and dried
1/4 cup field garlic greens, washed and dried

I like to pulse the greens in a food processor, especially handy for field garlic, and then transfer the mixture to a mortar and pestle to grind in the other ingredients in the traditional manner. While food processors are usually to be avoided for tender basil, they are quite handy for some of the tougher, more resilient wild greens. If you don't have a food processor, I recommend chopping the greens together very finely and then adding to the mortar along with the other ingredients.

**Combine with greens and pound in a mortar:**
1/4-1/3 cup black walnuts or pine nuts
1/4 tsp salt
2-4 tbs olive or black walnut oil

I usually add the first two tablespoons of oil to mix and spoon the pesto out of the mortar. I then will pour into a jar, and add one or two further tablespoons of oil to cover. Generally speaking, I like three tablespoons rather than four, but those who need a thinner sauce may prefer four our even more. When I need to thin this sauce out, either to make it go further or for consistency, I will mix a little hot pasta cooking water into the pesto, then dress the pasta or other dish. This is quite good on simple grilled vegetables, meat or fish as well.

### Dandelion Flower Vinegar

Nothing could be simpler than an infused vinegar to make use of all those bright dandelion blooms. There is no need to pull the petals, since the slight bitterness of the whole flowerhead adds a complex dimension to this vinegar. Make sure however to lightly rinse the flowers and free them of insects. To make, I simply cover the flowers in a jar with rice or apple cider vinegar. Allow to sit for a minimum of one week. It can sit longer, ultimately the best way to decide when to strain is by tasting a bit of the infusion. Once you like the flavor, simply pour the vinegar through a strainer into a clean, sterilized bottle. Store in a cool, dark place indefinitely. This also works wonderfully to make an infused olive oil, but that should be stored in the refrigerator once strained and used within a week or so.

*Mallory O'Donnell is a wild food enthusiast, avid gatherer and gardener, and professional in the landscaping industry. While working on a wild food cookbook many years in the making, Mallory posts many photos, food and foraging tips via Instagram and longer-form blog posts on How to Cook a Weed. Their focus is on not only safe and delicious wild foods, but sustainability, ethical foraging, and engagement with the wider world of nature. In addition, to expand the culinary repertoire of everyday cooks with not only common wild and invasive plants but more overlooked materials such as conifer needles and cones, hardwood barks and saps, and wild seeds and spices. howtocookaweed.com // Instagram: @mallorylodonnell*

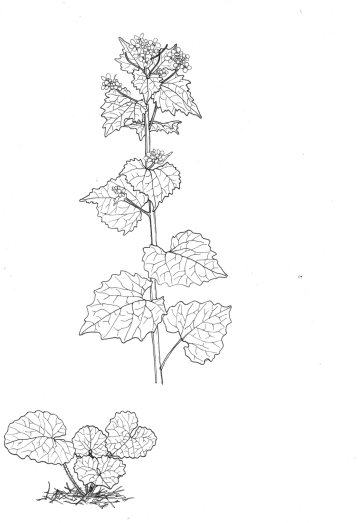

*illustration: Eileen Wallding*

## GARLIC MUSTARD - BY MALLORY O'DONNELL

The bane of the Northeast! Garlic mustard is a plant so invasive and so despised that the language some folks use to describe it can be quite vitriolic. If someone spoke in such terms about a person, we'd be quite taken aback. For a farmer or landscaper, for those who maintain nature preserves and parks, this is one of the most dreaded of plants, especially as it tends to love the margins and edges of woodlands. In its' native Europe it is much less intrusive, and has been used as an herb and green for millennia. Even there, some dislike its' flavor, however–grassy, pungent, it well deserves the name as while it is a mustard family plant there is a distinct garlicky flavor.

The key with garlic mustard is to take the tenderest leaves. As the plant matures it becomes stringy and bitter, with the pungent flavor becoming too bold for most peoples taste. The earliest greens (including its first shoots, "nature's microgreens") have a much more delicate flavor and are suitable for eating raw or pounding into herb sauces or pestos. After that point, I will usually blanch the leaves briefly to temper some of their arrogance.

As with all Brassicaceae (Mustard Family) plants, we should not restrict ourselves to the leaves alone. For many people the most delicious part of this plant is the floret, the tiny top of the pre-flowering stem which are like mini-broccoletti. These can be eaten raw or very lightly cooked. These should be picked before they become too woody and definitely before the plant flowers. My favorite parts are the seeds, which I use in place of black mustard seed in spice mixes and curries, and the large taproot, which is similar to horseradish but a bit mellower in flavor.

| Garlic Mustard Horseradish | Garlic Mustard Salsa Verde |
|---|---|
| Gather the roots of first-year garlic mustard plants in spring or fall, when a dense rosette of leaves has formed–the larger the rosette, the bigger the root. When using garlic mustard roots make sure they come from clean, uncontaminated soil. Scrub the roots and shred using the small holes of a box grater. If the roots are too small to handle this way they can be chopped into chunks and pulverized in a food processor. If the roots are too dry, add a small quantity of water into the food processor. Once you have them the consistency you like, add a tablespoon of vinegar for every half-cup or so of roots. Again, if they seem too dry you may like to add more. In addition, a pinch or two of salt and a teaspoon or so of sugar should be mixed in with the roots. Allow this to rest for at least 24 hours, then it is ready to serve. Should last in the refrigerator almost indefinitely. For an Eastern European style variation, add a little sour cream and/or crushed walnuts. | To me the best way to make any variation on this classic Italian sauce is by hand (in a mortar and pestle) and to taste, adding ingredients slowly. I start with a handful of garlic mustard leave and about half as much of parsley, and chop them well. Add to the mortar, then add a pinch or two of salt, a spoonful or two of capers, a couple of anchovies, a clove or two of garlic and a few dashes of ground mustard or mustard seeds. Crush this mix with the pestle until it is well integrated, then taste, adjusting as necessary. Add a few dashes of vinegar or lemon juice, crush again and taste. Finally and gradually, add extra virgin olive oil until you have the consistency you want. For a sauce to dip vegetables in, add more oil. For one to spoon on fish or meat, a bit thicker and less oily sauce will work better. Naturally other herbs and greens can be used as the base of this sauce, when in season I will use wild chervil or chickweed, for instance, instead of parsley. |

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## SUMAC WATER (OR SUMAC–ADE) – METHOD FROM FORAGE, HARVEST, FEAST BY MARIE VILJOEN

Sumac water is just the ripe fruit covered with water and strained. Sweeten it, or not, as you like. Quantities and concentrations will vary according to your forages. The ratio below yields a very sour drink. Use it in mixed drinks, in place of lemon juice, or added to braises and stews where tartness is required.

- 12 ounces (340 g) ripe sumac drupes, stripped from stalks (about 2 cups/500 ml)
- 5 cups (11/4 liters) water

Combine the fruit and water in a large clean jar. Leave at room temperature for 24 hours. Strain the liquid through a fine-mesh sieve and then through a double layer of cheesecloth. Sweeten if you like, and drink after chilling. It keeps for a couple of weeks in the fridge. Makes 5 cups (1 ¼ liters)

*Marie Viljoen is a wild foods author and cook, and author of Forage, Harvest Feast (Chelsea Green, 2018.)*



## AMARANTH AND CARAMELIZED ONIONS ON TOAST– RECIPE BY MARIE VILJOEN

Hearty amaranth makes a filling lunch or snack, sweetened by slow-cooked onions. A dense brown bread works very well with the iron-rich greens.

- ¼ teaspoon salt
- 1 cup (150 g) finely sliced onions
- 3 tablespoons extra-virgin olive oil
- 1 pound (453 g) amaranth leaves
- 6 cloves garlic, finely chopped
- 2 teaspoons lemon juice
- 4 slices brown seed bread
- 1 clove garlic, for rubbing

Salt the onions. In a medium pan over medium-low heat, sauté the onions in the oil until darkly golden—about 20 minutes. While they are cooking, bring a pot of water to a boil and drop in the amaranth for 1 minute. Remove and squeeze dry. Add the chopped garlic to the caramel- ized onions and stir well. Add the blanched amaranth and increase the heat to medium. Stir well. Add the lemon juice and cook for a few minutes until the leaves are bite-tender. Taste for seasoning and add some more salt and lemon if you like. Toast some very good seedy bread, rub it with garlic, and top it with the greens. Serves 2 as an entrée, 4 as an appetizer.

*Marie Viljoen is a wild foods author and cook, and author of Forage, Harvest Feast (Chelsea Green, 2018.)*

## **RAW PURSLANE AND YOGURT SOUP** – ADAPTED FROM FORAGE, HARVEST, FEAST BY MARIE VILJOEN

Succulent purslane and juicy cucumbers appear when warm weather invites chilled soup. Pack everything into a blender and 20 seconds later you have a rich, reviving, and very healthy tonic. (Save tender purslane stems for pickling.)

- 6 ounces (170 g) purslane leaves, washed
- 1 ½ pounds (680 g) cucumbers, peeled* and cut into chunks
- 2/3 cup (160 ml) yogurt
- 3 cloves garlic
- 1 tablespoon white wine vinegar
- 1 teaspoon sugar
- ½ teaspoon salt
- 3 tablespoons extra-virgin olive oil
- If you have thin-skinned Persian cucumbers, no need to peel.

Pack all the ingredients into a blender, pushing the leaves down firmly to make room. Blend until smooth, stopping occasionally to push more solid pieces down. If the mixture is too thick for your liking thin with a little water and adjust seasoning after tasting. Transfer to a jug or serving bowl and chill before serving. Serves 4 as an appetizer.

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## **FAST MANGO AND WOOD SORREL SALAD** – RECIPE BY MARIE VILJOEN

The appeal of wood sorrel is its fresh, acidic bite. Use it like lemon or lime in fresh but savory fruit salads. (Substitute perfect peaches in their season.)

- 2 ripe mangoes, sliced thinly
- 1 cup wood sorrel leaves and tender stems
- 1 tablespoon fish sauce
- ¼ teaspoon red chile flakes
- 1 teaspoon toasted sesame oil

Toss all the ingredients together and serve at once. Serves 4 as a side.

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## **DANDELION AND RHUBARB SHORT RIBS** – RECIPE BY MARIE VILJOEN

Dandelion's bitter edge pairs very well with miso, soy and the sourness of late spring rhubarb. This rich, easy stew is fall-apart tender. It keeps very well and reheats like a dream.

- 1 pound (453 g) dandelion leaves
- 2 tablespoons miso
- 4 beef short ribs (about 1 pound/453 g each), 1 rib per person
- 2 tablespoons soy sauce
- 1 cup (120 g) rhubarb cut into thick slices
- 1 tablespoon sugar
- 1/2 cup (70 g) field garlic bulbs (or 8 cloves garlic)

Preheat the oven to 400°F (200°C).

Bring a pot of water to a boil. Drop in the dandelion leaves and blanch at a boil for 30 seconds, dunking them under. Remove, drain, refresh in cold water, and squeeze dry.

Thin the miso with a little water. In a Dutch oven or casserole dish, combine all the ingredients and add 2 cups of water, or enough to cover the beef. Place in the oven and cook for 2 ½ hours. Check on it every 40 minutes or so, pushing the dandelions beneath the surface and turning the ribs so that the tops brown evenly. Eat at once, or cool then chill until Day 2 or 3, reheating gently after removing some congealed fat. (Serve with spoons for the sauce.). Serves 4.

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**Edible Weeds on Farms: Northeast Farmer's Guide to Self-Growing Vegetables**
www.foundwith.care/weeds-as-crops

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## CHICKWEED SPRING SALAD – RECIPE BY MARIE VILJOEN

The distinctive, corn-silk nuttiness of chickweed is appreciated best raw. Serve as a salad, or on top of sourdough toast as a fresh spring bruschetta. Also great served over slices of creamy burrata.

- 2 tablespoons sherry vinegar
- Large pinch salt
- ¼ cup hazelnut oil
- 4 cups chickweed
- 3 tablespoons toasted, chopped hazelnuts
- 3 tablespoons dried apricots, finely chopped

In a large bowl whisk the vinegar and salt and then add the oil. Just before serving the salad add the chickweed, nuts and apricot. Toss well and eat at once. (If using for bruschetta allow the greens to wilt for 10 minutes in the dressing before topping the toasts.) Serves 4 as a side.

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## LAMB'S QUARTER SOUP – RECIPE BY MARIE VILJOEN

This substantial, quick and easy soup is extra good if you have flavorful homemade stock.

- 8 ounces (227 g) lamb's quarters
- 4 cups (1 liter) chicken stock (substitute vegetable if preferred)
- Salt
- 2 tablespoons lemon juice
- 2 large egg yolks
- Black pepper

2–4 poached eggs (optional, and depending on number of people)

Bring a pot of water to a boil. Drop the lamb's quarters in for a minute. Remove and drain the leaves, refresh them, and squeeze them. Chop them roughly. Bring the chicken stock to a simmer over high heat. Taste it and add salt, if necessary. Add the lemon juice. Add the blanched lamb's quarters and stir. Cook for 3 minutes. Transfer the soup in batches to a blender and pulse briefly. Return to the pot and heat over medium-high heat. Do not boil. Whisk in the egg yolks and grind in some fresh black pepper. As soon as the soup is hot, it is ready to eat—any longer and you kill the beautiful chlorophyll-green. If you are adding poached eggs, add each one to individual soup bowls after you have poured the hot soup (you can poach the eggs ahead of time). Serves 4 as an appetizer, 2 as an entrée.

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## **GARLIC MUSTARD PESTO** – RECIPE ADAPTED FROM FORAGE, HARVEST, FEAST, BY MARIE VILJOEN

Garlic mustard makes a pungent, slightly bitter pesto. It freezes very well. For a milder pesto, blanch the raw garlic mustard in boiling water for 1 minute.

- 6 ounces (170 g) tightly packed garlic mustard leaves, tender stems, or flowers
- 2 ounces (57 g) pecans
- 3 ½ ounces (99 g) grated Parmigiano-Reggiano
- 3 tablespoons butter
- 1/3 cup (80 ml) extra-virgin olive oil
- Salt

Combine all the ingredients in a food processor and pulse until they form a rough paste. Scrape the sides down, add a large pinch of salt, and repeat. Taste. Add more salt if necessary. If the mixture is too stiff, add a little more olive oil. Makes 2 cups .

*Marie Viljoen is a wild foods author and cook, and author of Forage, Harvest Feast (Chelsea Green, 2018.)*



## **JAPANESE KNOTWEED HUMMUS** – RECIPE FROM FORAGE HARVEST FEAST, BY MARIE VILJOEN

Raw Japanese knotweed shoots add the indispensable lemony note as well as a fresh green to spring hummus. Serve with dense bread, crackers, or raw vegetables.

- 2 cans (each 15 ½ ounces/439 g) chickpeas, drained
- 3 ounces (85 g) sliced young Japanese knotweed shoots
- ½ cup (125 ml) tahini
- 10 field garlic bulbs (or 4 ramp bulbs, or regular garlic cloves), peeled and trimmed
- ¼ teaspoon salt
- ¼ cup (60 ml) cold water, plus extra

Place the chickpeas in a food processor and pulse until roughly chopped. Add the knotweed, tahini, field garlic, and salt. Process again. Finally add the water in a stream and process until you have a very smooth and creamy paste. Taste, adding more salt if necessary. If the paste is still too thick, add more water. Serves 4–6 as an appetizer.

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## **NETTLE AND LAMB STEW** – RECIPE BY MARIE VILJOEN, ADAPTED FROM FORAGE, HARVEST, FEAST

Inspired by *abbacchio alla Romana*, a Roman lamb stew that relies on herbs with vinegar and anchovies for its distinctive flavor, this spring comfort food adapts very well to wild greens. Silky nettles melt into the sauce. Serve with field-garlic-rubbed sourdough or buttered rice.

To de-sting young nettles blanch them by dropping into boiling water for 60 seconds, then drain and squeeze well. *8 ounces fresh nettles yield 1 cup blanched, squeezed nettles.*

- 2 tablespoons olive oil
- 2 pounds (907 g) leg of lamb meat, cut into 2-inch (5 cm) pieces
- 2 cups (500 ml) water
- 2 cups (8 ounces/227 g) blanched nettles
- ½ cup (14 g) chopped field garlic greens (or 4 cloves garlic, chopped finely)
- 8 anchovies
- 2 tablespoons good vinegar

In a saucepan heat the oil over medium-high heat. Add the lamb in batches and brown on two sides. Add all the other ingredients except the vinegar. Bring to a boil then, reduce the heat and cook on the stovetop at a simmer for 1 ½ hours, covered. Remove the lid and add the vinegar, stirring well. Cook at a gentle bubble for another 40 minutes, without the lid. If it threatens to dry out, add a little water. The result should be a rich, thick juice in the bottom of the saucepan, with very tender meat. Serves 4.

*Marie Viljoen is a wild foods author and cook, and author of Forage, Harvest Feast (Chelsea Green, 2018.)*



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# EDIBLE WEEDS COLORING PAGES


**Edible Weeds on Farms: Northeast Farmer's Guide to Self-Growing Vegetables**
www.foundwith.care/weeds-as-crops
Illustration: Tusha Yakovleva

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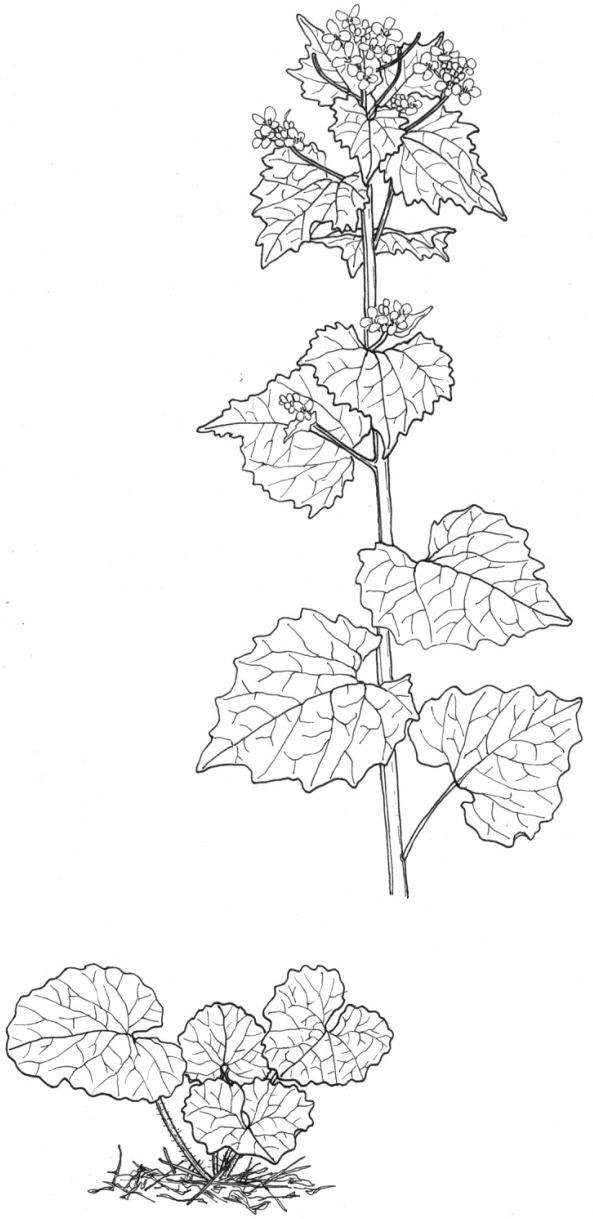
GARLIC MUSTARD

*ALLIARIA PETIOLATA*





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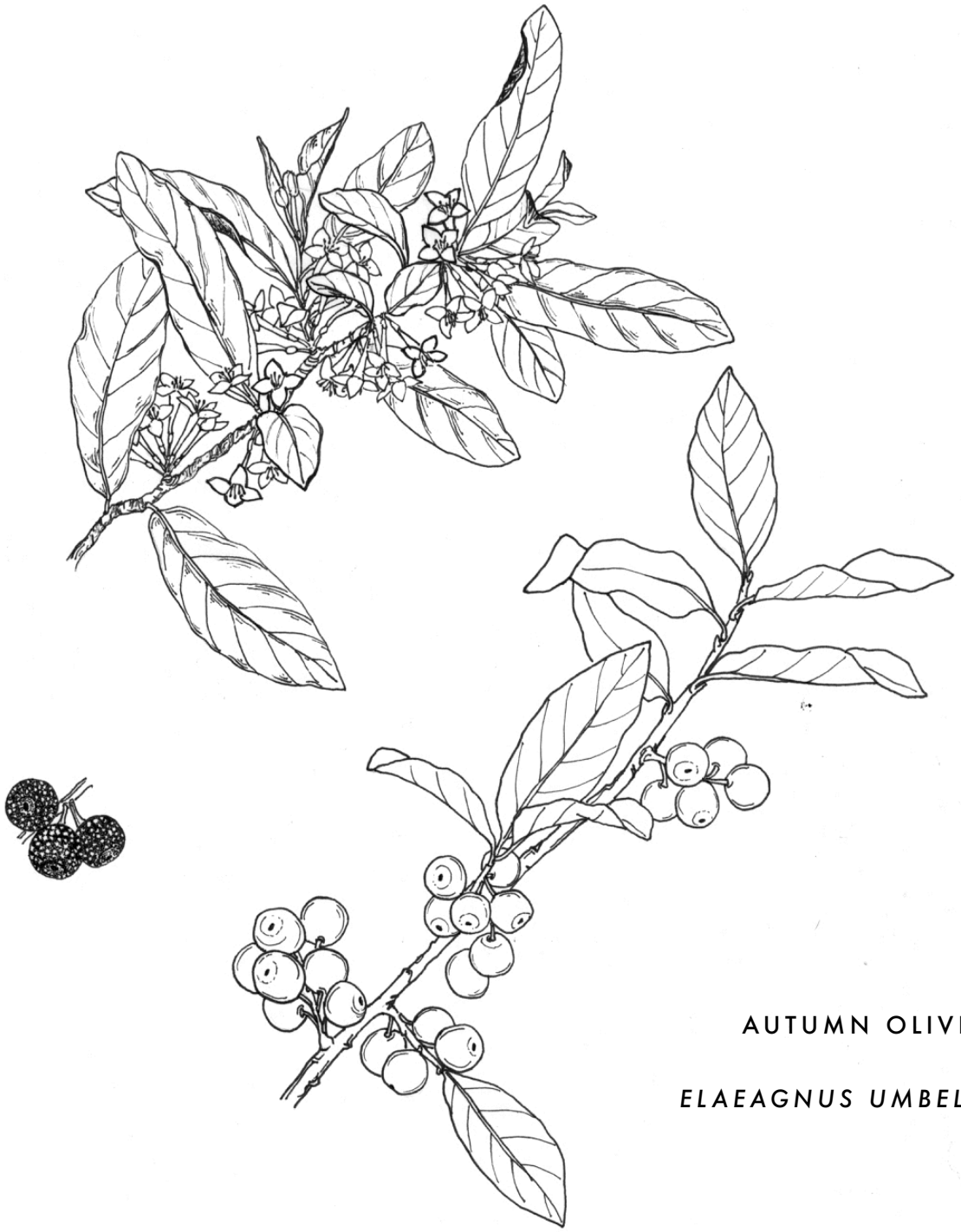

AUTUMN OLIVE

*ELAEAGNUS UMBELLATA*

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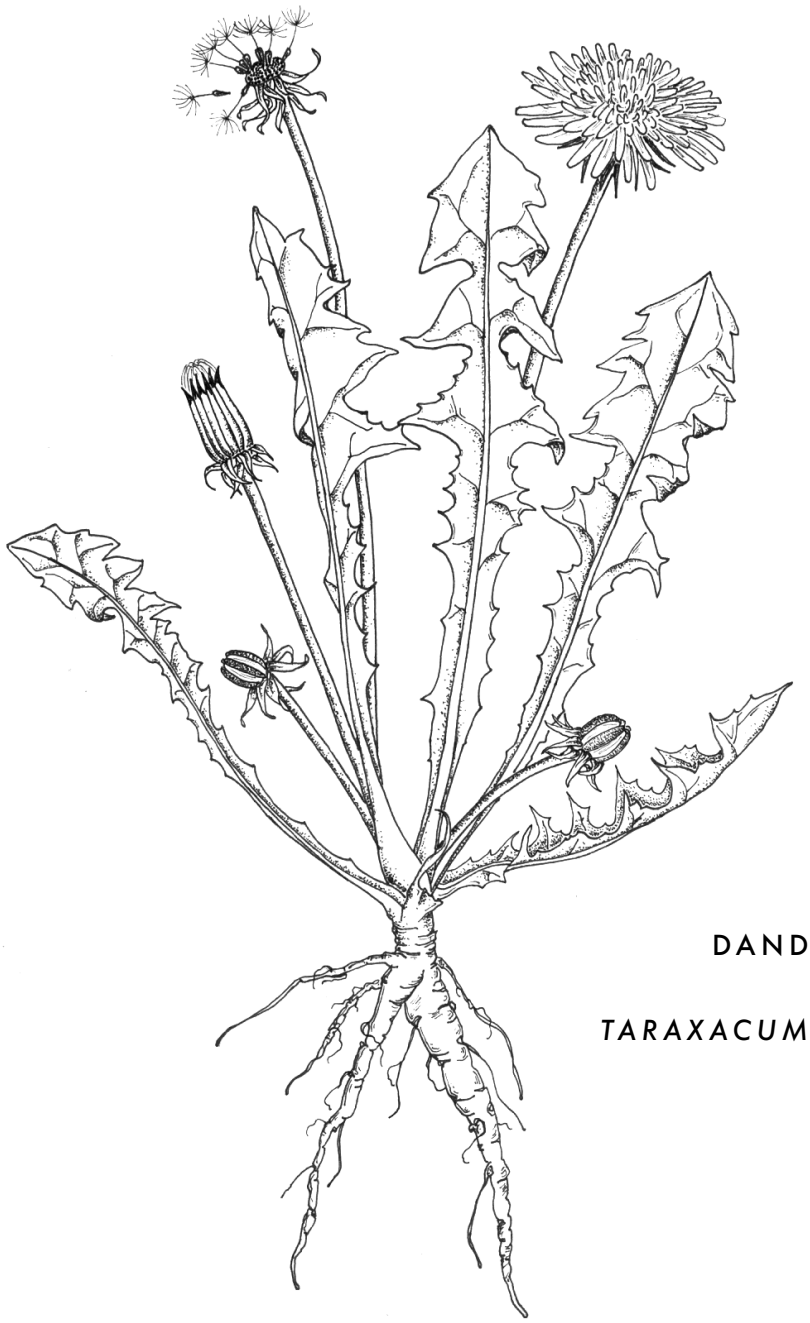

DANDELION

*TARAXACUM OFFICINALE*

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CHICKWEED

*STELLARIA MEDIA*

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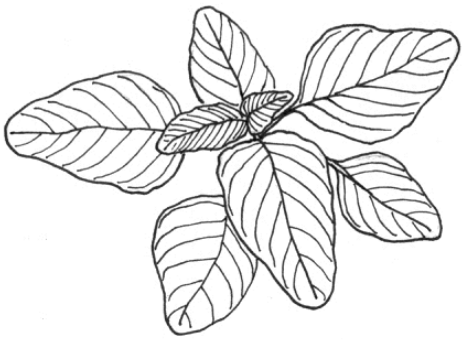
FIELD SORREL

*OXALIS STRICTA*

AMARANTH

*AMARANTHUS SPECIES*



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LAMB'S QUARTERS

*CHENOPODIUM ALBUM*

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JAPANESE KNOTWEED

*REYNOUTRIA JAPONICA*

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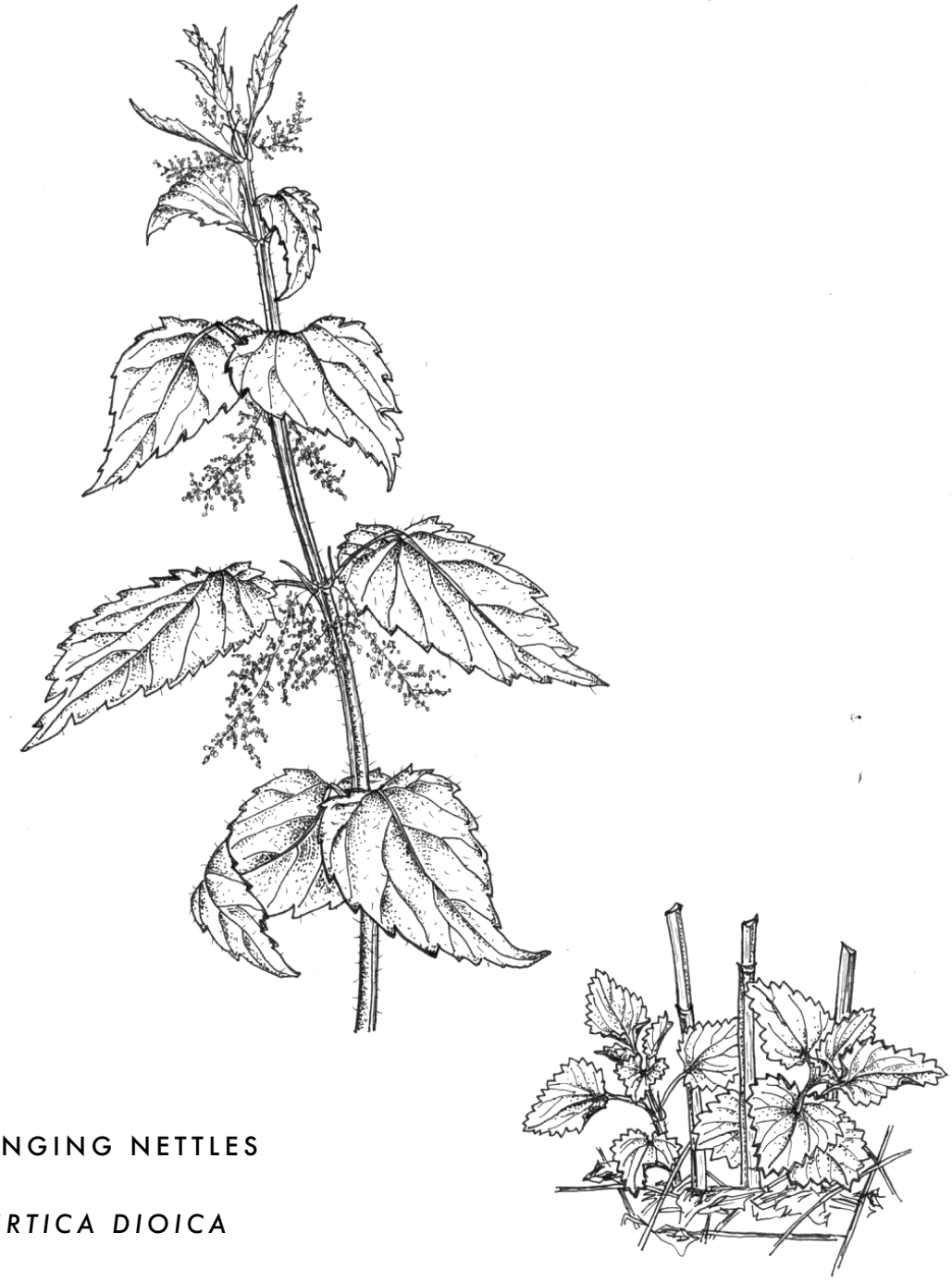

STINGING NETTLES

*URTICA DIOICA*

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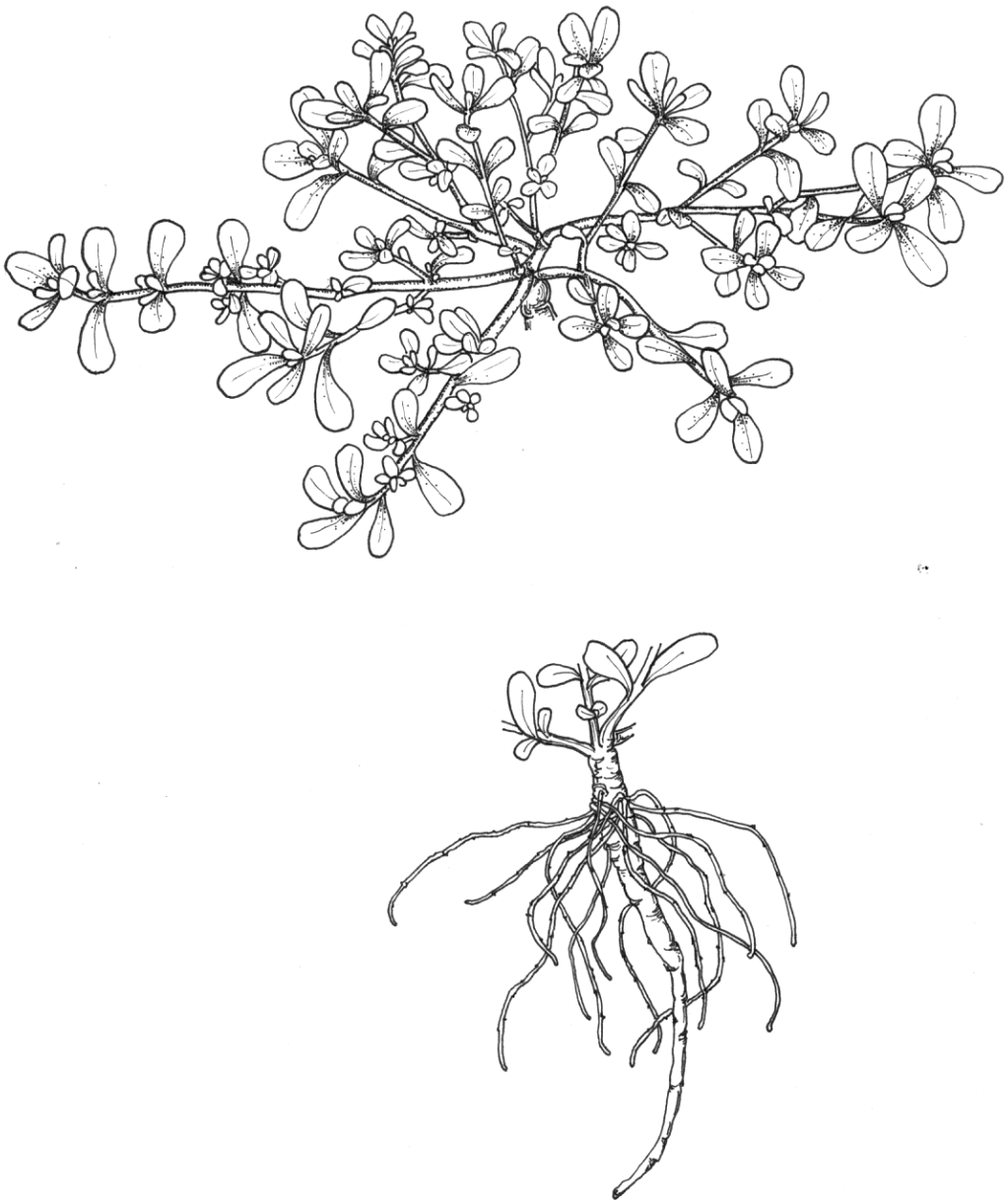

PURSLANE

*PORTULACA OLERACEA*

# BIBLIOGRAPHY, RESOURCES, AND FURTHER READING

Please find an ever-evolving list of
relevant resources and a hyperlinked
bibliography for this guide at:

WWW.FOUNDWITH.CARE/WEEDS-AS-CROPS-RESOURCES