

Enjoying Sunflowers

More than just pretty flowers!



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Published in 2025.

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ENJOYING SUNFLOWERS: MORE THAN JUST PRETTY FLOWERS!

First edition. November 17, 2025.

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Written by G. Edwin Varner.

Preface

It is one of the botanical wonders that amazes people of all ages, no matter how many times they see it in bloom. It is the most recognizable and easily named garden flower. In fact, it is the only garden flower that actually has the word “flower” attached to it.

Even its Latin name, coined by Swedish biologist and taxonomist Carl Linnaeus, precisely describes its appearance, referring to it as *Helianthus* — a combination of helios, meaning “sun,” and *anthos* or *anthus*, meaning “flower.”

This fantastic plant is called **The Sunflower**.

In this ebook, you will discover several ways sunflowers have benefited the world from ancient times to the present, and into a possible future. You will learn about historic accomplishments associated with growing them, their variety of species, colors, and sizes, as well as cultural appreciations ranging from artistic subjects to festivals celebrating them. What is even more remarkable is the multiple ways these plants help solve environmental problems.

There are many ways to enjoy these garden-to-agriculturally accepted plants, the least of which is admiring such pretty flowered behemoths. What is a sunflower, and why is it important to us? You’re about to discover all those incredible reasons.

Please note: I have copied pertinent information from my previous ebooks, corrected known mistakes, including minor grammatical and spelling errors, and added new material to this ebook.

The digital photos are from my home, public gardens, many nurseries within my area, and Creative Commons (CC0) licensed images.

Introduction



There are more than 70 species of sunflowers, and who knows how many hybrid varieties have been formed over many years. All of them are native to the North American continent and limited areas in Central America. They are a member of a vast family of related plants, including daisies, asters, chrysanthemums, dahlias, marigolds, and zinnias, collectively known as composites.

What appears to be a single flower is actually a consortium of smaller flowers, known as ray and disc florets. Ray florets have brightly colored, noticeably fused petals, but are sterile and unable to form seeds. The disc florets are the fertile seed-forming parts, which are less physically noticeable, typically without petals, and are located within the interior of the flower head.

Earthly Radiance

One remarkable ability of most sunflowers is that their developing growth turns with the arc of the sun during the day — thus, their common name, “sunflowers.” This response ensures the plant receives maximum sunlight exposure, even on cloudy days. During the night, the plant reorients to face east again. This “innate” behavior, called heliotropism, occurs only while they are young.

Depending on the species or hybrid, these plants can grow upward to 12 feet or more, provided they are grown in full sunlight and well-drained, fertile soil. One endearing quality of these plants is that they are remarkably easy to grow. Drop a seed in the ground, add water, and within a week or more, a strong seedling rises, and the sky is the limit. They are one of the best low-maintenance garden (and farm field) plants available.

Sometime in the summer, the flower head matures and begins “flowering.” Incredibly, it nearly always remains pointing toward the east. It’s as if it has a built-in compass, but it prefers to orient eastward. The sight of an entire field of hundreds of blooming plants is mind-boggling! Why do they do this? One theory is that the rising morning sun warms the flower heads, releasing pollen and nectar and attracting early-rising pollinating insects.

Good Things Come In Small Packages

What we commonly think of as seeds, sunflowers actually produce hard-shelled achenes (or hulls) that contain the actual seed kernels. Botanists describe an achene as a dried fruit. I know, it’s weird, but what can we do? Anyway, depending on the species and variety, the number of potential achene (seed) formations can range from a few (in smaller-flowered wild species) to several hundred, or even thousands, in those large-headed varieties.

The achenes and the seeds they contain are relatively large, and it is due to this size and abundance that our sunflower truly shines in its popularity, not only as a gorgeous garden plant but also as an agricultural marvel that few other garden flowers, if any, achieve in

recognition. This agricultural importance is why sunflowers have played a prominent role in shaping human history.

Do I detect a hint of skepticism in your mind over reading about this historical significance? Dare to be surprised by learning what a sunflower can offer beyond its radiant beauty? You will be amazed by what this brilliant plant has already achieved and will continue to do so in the foreseeable future.

A Stellar History

Oh no, the obligatory history lesson! OK, I'll try to make this section as painless as possible, for we really need to understand the sunflower's history to appreciate its present importance. This is a condensed lesson, so please bear with me if some of the material is not exactly accurate.

How far back in time do we venture? Way, way back it seems. "*A long time ago in a galaxy far, far away....*", wait... that's the original *Star Wars* movie introduction. Sorry! Let me revamp it here to read, "*A long time ago in ancient societies not so far, far away,*" sunflowers of various species were held in high regard in culture and religion. Not only were seeds an excellent added source of food, but they also served as medicine and as a dye for clothing.

The Hopi Way

Anthropologists currently estimate that sunflowers were cultivated as an agricultural supplement, possibly as early as 4000 to a liberal estimate of 8000 years ago, in areas of what is now the southwestern United States, including the indigenous native cultures of the Hopi, Pueblo, and Navajo, plus extended throughout Mexico, with the Maya and Aztecs.

Some authorities have even suggested that sunflower seeds predate the widespread cultivation of beans and maize (corn). I am sure there have been several verbal and physical fights in heated debates over whether that statement is a fact or a theory.

One accurate point is that the dried seeds were ground into a flour for making flatbread or mixed with water or milk to form a nutritious porridge-like gruel. Another culinary technique involved compressing the fresh seeds to extract their oils, which were used to fry meat and other foods. This sounds like the beginning of "fast food," eons before French fries were created. More than likely, it was much healthier back then.

Strange but true, different sunflower species were also harvested throughout the interior of the American continent, even extending to the Eastern coastal regions. Again, the seeds were harvested and processed in the same way as those of the Southwestern cultures. Did the trading of ideas or an independent discovery of using sunflower seeds result in using them for food and oil in these separate locations? Enquiring minds still are wrestling with that question.

Well, There Goes The Neighborhood



All good things must come to an end. In this case, it happened sometime in the early 1500s, when the trouble-maker Spanish conquistador explorers invaded these civilizations and pillaged, plundered, and downright murdered those innocent people. The marauding thugs took everything of value — gold, silver, jewels, and enslaved people — back to Spain and eventually the rest of Europe.

Another item caught their attention, and that was, you guessed it, sunflowers. We can only imagine what their first words were. Maybe something like, “¿*Qué diablos son esas enormes margaritas amarillas?*” Honestly, can you blame them? What strange (but beautiful) botanical wonder was this?

So, they packed their sea voyage luggage with thousands of seeds, along with jars of oil, and stuffed in a few blooming plants inside for good measure, to prove what they had discovered. Somebody in Spain would find these plants valuable. Yes, they did, and sunflowers eventually became a highly valuable curiosity throughout Europe.

Initially, the plants were collected by the aristocracy to embellish their private gardens. If you wish to brag about your flower gardens, these newly discovered sunflowers were just the thing to grow. Over succeeding generations, plants that produced more colorful, larger flower heads became increasingly popular, eventually surpassing the older, wild-type plants.

When word of the newly discovered sunflower species in the interior and eastern areas of the New World spread, investors wanted the seeds shipped back to Europe. These species thrive in dry, open, grassy areas such as meadows (prairies) and, in “making the best of it”, less-than-ideal habitat.

The Native American Plains cultures cultivated these various species as a year-round food source by saving the nutritious seeds and the starchy tubers of the perennial species (if available). German naturalist Prince Maximilian of Wied-Neuwied led an expedition into the American West during the 1830s, encountering more species. One species named after him, *Helianthus maximiliani* or Maximilian’s Sunflower, still grows wild in many central and eastern US states.

Another important species, the Jerusalem artichoke (*Helianthus tuberosus*), also called sunchokes, is native to central North America. It was (and still is) cultivated for its starchy tubers. These root tubers are long-lived and thrive in the dry prairie environment. Early explorers learned of this species from the native American tribes and sent

shipments of tubers back to Europe, hoping to establish it as a naturalized species there.

These tubers are packed with protein, minerals, and vitamins. You could say it is the perfect food item. It would have been immensely popular had it not been for its poor digestibility, which caused excessive smelly flatulence (also known as "breaking wind"), and the more productive, better-digesting, and easier-to-grow starchy vegetable, the potato. Just wait — you will discover a surprising thing about the relationship between potatoes and sunflowers later.

Not Crude But Tasteful Oil



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Eventually, word of decorative sunflowers' popularity spread eastward to the great Russian empire. Whatever European royalty enjoyed, so did the Russian Tsars. Peter the Great was so enamored of these stately,

tall-growing, daisy-like flowers during his visit to the Netherlands that he (like many tourists) brought back souvenir seeds to Russia. At first, the Russians enjoyed the beauty of the sunflowers, but something radical happened. A significant interest in the seeds themselves became the top priority.

Like the ancient Native Americans and Mexicans, who harvested the seed kernels to make flour or pressed them into oil, the Russians began doing the same and, over several years, transformed the sunflower from a garden flower into an agricultural crop. That may not have happened if not for the Russian Orthodox Church. No, not divine intervention, but by the church and its rules concerning Lent.

In the 18th century, the church banned all foods cooked or fried with animal fats during Lent. Sunflower oil is a plant oil, so the church officials declared it safe for eating. Hooray! It became so popular that everyone wanted the oil, not only in Russia but also in the surrounding regions.

Sunflower oil thus became their new economic commodity. Within the 19th century, Russia and nearby Ukraine were planting and harvesting several million acres of sunflowers every year, most of which was processed into cooking and industrial lubrication oil. Machinery needed to be lubricated, and in many parts of the world, crude oil extracted from underground was not readily available. Sunflowers proved valuable due to their excellent oil viscosity in many environmental conditions.

During this time, farmers discovered naturally occurring hybrid strains that produced more oil. Genetics was unknown at that time, and it was through observation that some sunflower “varieties” could produce larger flower heads (and thus more oily seeds). Here is where our familiar, huge sunflower plants and flower heads originated.

Meanwhile, Back At The Ranch

Unlike in all of Europe and Russia, sunflowers were not especially popular in the United States until Russian immigrant farmers arrived in the upper Midwest and lower Canadian provinces, smuggling in seeds

of some of those large-headed sunflowers. At that time, there were no customs agents, so they did not need to worry about confiscation. Fortunately for both Canada and the US, this was a remarkable circumstance, as sunflower farming would eventually begin in this region.

In the United States, other crops were cultivated, such as corn, tobacco, and, especially, cotton, for which slavery was introduced and persisted until the Civil War finally put an end to it.

Another major agricultural crop, usually ignored in history books, was the peanut. It was discovered in South America by the Conquistadors, who brought it back to Spain and the rest of Europe, which in turn spread it to Africa and the Middle East. The slave traders who enslaved the native African people introduced the peanut into the New World colonies, that is, the pre-United States.

The cultivation of peanuts helped to feed both the slave population and, surprisingly, the Union soldiers, as well as livestock. Many people disliked eating raw peanuts until the discovery of roasting and salting them made them a mouth-watering sensation.

OK. Fine. So, what do peanuts have to do with sunflowers? While Europe and Russia processed sunflower oil (southern Europe also enjoyed olive oil), peanut oil became a booming commodity in the United States. Eventually, corn oil (also known as vegetable oil) and soybean oil overtook peanut oil dominance. (Motor oil was another highly profitable discovery, but we don't consume it, do we?)

Another peanut product, known as peanut butter, was created and first introduced to the general public at the 1904 St. Louis World's Fair. Now, stay tuned: peanut butter will make another appearance alongside sunflowers later in this ebook. Oh my, the plot thickens — literally.

I Spy For Sunflowers

As time marched forward, politics changed, as did countries. Russia and the surrounding countries became part of the communist Soviet Union. The cultivation of sunflowers for cooking oil production continued at a record pace, supplying most of Europe for several years. This created

economic tensions for the United States, as it concentrated on raising corn and soybeans for the food oil market. US farmers were not keen on growing this giant garden flower in their fields. It was the garden flower breeders who developed new, colorful varieties by combining genes from wild sunflowers to create highly disease-resistant types that gardeners would love to include in their gardens.

In the 1960s, the Soviets began experiencing problems with the growth of their sunflower crops. As with any plant, viral and fungal diseases began to take a toll on the health of their high-oil sunflower varieties. Due to the Cold War, the Soviets had no means to ask for help from the US and Europe. There was that pesky constant threat of nuclear war with the United States that complicated negotiations.

What other way could there be to obtain genetically fresh sunflowers? Hey! Why not spy on the US and try to smuggle out some of those new-fangled sunflower varieties and hybrids (along with a few top secret nuclear weapons plans and manuals?) And so, they secretly did — and the US reciprocated as well. Think about it — spies, plots, smuggling, secret codes, you name it — all concerning nuclear technology and sunflowers. Who would have thought about this combination?

Anyway, all that changed in the 1970s. The Soviet Union revitalized its sunflower and oil crop production (not to mention who knows what nuclear technologies), while the US “discovered” new reasons for growing sunflowers. Still, the US farmer was hesitant to raise them, but some enterprising farmers took the plunge, which brings us to the present. What “new” products do sunflowers provide for us? We will discover them later, but first, we need to review what makes these plants so popular with the average person, especially among gardeners.

This long journey into the convoluted, condensed history of sunflowers concludes (did you say “*FINALLY!*”). Work continues to make a sunflower even shinier and healthier. With the development of numerous varieties over the years, it is challenging to categorize them all. But let’s give it a try in the next section.

Keeping Up Appearances

What began as small, yellow, daisy-like wildflowers that ingenious people took a liking to has eventually transformed into a wide range of plant and flower-head sizes and colors. Even the seeds (actually, the achenes) have evolved into varying sizes and shades, including off-white, gray-striped, and pure black or deep purple.

As reported in the previous section, their oil content differs significantly, affecting human interaction and history. Here, we will review the entire sunflower plant's appearance to understand its appeal to many people who are not associated with any economic commodity interests. What makes this plant so special to be grown for generations of admirers? Well, let's find out and be amazed by the wonder of the sum of all its parts.

What Goes Around Comes Around



We are going to have another short history lesson (*Ugh!*), but this time spiced with some algebraic mathematics. *WHAT? Algebra?* I know, horrible memories of high school math class. Calm down. You will discover something unusual and truly remarkable that unites sunflowers with several other natural phenomena.

It all begins with a guy named Leonardo Fibonacci from Pisa, Italy, who discovered the use of fractions (using the standard $\frac{1}{2}$ notation with that horizontal bar) and also the decimal point. He also found in 1202 a unique, if somewhat startling, mathematical formula involving circles or spiral formations. *OK. So what does this have to do with sunflowers?* Just wait and see what is already in plain sight when viewing the flower heads and seeds. It's really mind-boggling.

Signore Fibonacci calculated a natural mathematical formula involving the addition of two previous numbers. His calculations can be shown as: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, and so on, where each number is the sum of the two previous numbers. This sequence of

numbers is now called the Fibonacci Sequence. When applied to a graphic illustration of his formula, it displays an ever-increasing circular pattern or spiral.

He unknowingly discovered a common natural phenomenon that illustrates how to fill a circular object with the right amount of material. In our case, when viewing sunflowers, the seed-containing head exhibits an efficient spiral arrangement that maximizes seed placement within the flower head's volume.

I know, this isn't easy to comprehend (or for me to write). Look at the above photo of a sunflower head. Do you notice the counter-clockwise spiral rotation of the small, underdeveloped seeds? Those spirals are arranged via the Fibonacci Sequence equations stated above. If you stare within the flower head, you encounter a weird, psychedelic, spirographic visual pattern.

Leo's equation also applies to other spherical objects, ranging from daisies, a snail's shell, pinecone scales, hurricane cloud spirals, and ultimately, to the rotating spiral arms of our galaxy and countless others in the universe. How's that for demonstrating the interconnectedness of sunflowers to the universe? That's both spooky and inspirational.

Size Does Matter

Today, we can cultivate a diverse array of sunflowers to meet specific display needs. Here you will be acquainted with a few interesting sunflower varieties to grow in your garden — or that unused several-acre lot next to your house.

Let's begin with the size and color of the seeds. Species seeds tend to be relatively small, which corresponds to the small size of their flower heads. They, along with smaller-sized hybrid varieties, tend to have equally small seeds, typically ranging in color from white to black.

Another factor related to seed size and color is the amount of oil contained in the kernel. Yes, we are back to that historical seed oil lesson described earlier. There are two types of sunflower seeds primarily used for commercial purposes: Oilseed (also known as black-

oil sunflower seeds), which is commonly found in backyard bird feeders and used to produce sunflower oil for cooking. Their seed hulls are small and black, and the kernels contain a high amount of high-energy oil. Non-oil seed hulls are larger, black-and-white (or gray-and-white) striped, and the kernels are used primarily for snack food. More information will be described later in this ebook.

For a cultivated tall variety of sunflower — over 10 feet — the impressive **Mongolian Giant** will make a powerful impression on anyone with its remarkable height and huge (and I do mean HUGE) seeds. I held one seed that measured over one inch! The hungry birds will also be stunned by the size of these seeds. Some will have difficulty cracking the hulls to extract the seed kernel, but it will be a treat if they succeed.

Brobdingnagian and Lilliputian Sunflowers

At times, you can be like Lemuel Gulliver in his travels when encountering the different sizes of these plants, which also vary in startling degrees. Like the above Mongolian Giant variety, there are several other tall types that astound people (usually non-gardeners, but for us gardeners, it is nothing special — but it really is!)

One famous yellow-flowered variety is **Titan**, which towers well over 12 feet. The flower head, filled with seeds, can measure up to two feet in diameter. Other representatives of “giganticus” proportions are the **Russian Mammoth** and **Skyscraper**. Sunflowers this tall have to be supported by massive, fibrous stalks. Even they are a sight to behold.

Then, on the opposite pole, are the dwarf sunflowers. These are perfect for small gardens and pots, and other containers. These types grow like regular plants, but only to about three feet tall. Some recent varieties reach 2 feet tall. Most varieties have side branching with several smaller flower heads. Varieties to search for are **Suntastic Yellow**, **Sunny Smile**, **Pacino**, and **Little Becka**. All are grown from seed. Don't think for a moment that these more miniature sunflowers are less impressive than their taller siblings. They are just as remarkable!

One significant change in sunflower growth also occurred over the years. The plants originally produced numerous side branches, culminating in several smaller flower heads. Many modern varieties destined for flower gardens still retain this trait. Still, those bred for agricultural use form a single thick stalk topped with a massive flower head containing several thousand seeds. Years ago, before growing sunflowers in home gardens became the rage, this was the standard form available. Think of it as the old farmyard or cottage garden type.

Most commercially available sunflower seeds are of annual varieties. We are all familiar with the large flower heads of tall, massive plants nodding by the sides of vegetable or flower gardens.

What Color Is The Sun?



Most people (especially non-gardeners) associate sunflowers with always being yellow. Over the past few years, interest in wildly colorful sunflowers has grown into a “cult following.” With advances in genetics,

new and unusual varieties have emerged on the gardening scene. Newer varieties showcase pastel shades of yellow, including an “almost white” variety called **Italian White** (shown above). It has some pure white petals, but a persistent yellowish tint is also present.



Some varieties are vibrant oranges and deep reds (like the above **Chianti Hybrid** variety) that, under certain light conditions, appear dark garnet and black. Another color type is dark burgundy, which some gardeners and breeders describe as resembling a purplish coloration — not royal purple but a reddish-purple blend. It’s not my favorite, but it is unusual. The real fun begins when some of these various colors are displayed together.

I could name specific examples of these colorful varieties, but each year, new ones are introduced while older types are offered less often. Many flower catalogs, both in print and online, will highlight these newer hybrid varieties each year. They can make any garden radiate amazing colors from midsummer and into the fall.

Double Your Pleasure, Double Your Fun



Not only has the petal color changed with today's sunflowers, but so has the size and shape of the flower heads. Like many of our other garden flowers, single-flowered types can also produce double-flowered varieties — those with an excessive number of petals. Sunflowers are not an exception. If you have never seen or grown the varieties called **Teddy Bear** (which received the Award of Garden Merit from the Royal Horticultural Society in 2015) and **Honey Bear** (photo shown above), you are missing out on a wonder of wonders in flower gardening.

Each variety can grow tall but has very thick stems to support the enlarged flower heads, which are stuffed full of yellow to orange petals. Here is an example of how the interior disc florets can sometimes change to resemble the ray florets. The overall appearance of this variety is a shaggy, sometimes frizzy ball of petals.

You may think the entire flower head would never form seeds, but the opposite is true — to some degree. Most fertile disc florets lie in the very center of the head. There is not much pollen formed, and pollinating bees will have to spend more time searching for it and nectar. But limited amounts of seeds do eventually form.



You can also grow smaller-sized plants and truly double-petal flower heads. Make sure you locate the perennial *Helianthus x multiflorus* '**Sunshine Daydream**' (shown above), a 2008 selected form of the '**Flore Pleno**' hybrid of two sunflower species. Wow, if this name does not make you stop and stare, the stunning flowers will. If you could only view the double, 4-inch, bright yellow flowers of this variety, you might mistake it as being a dahlia or chrysanthemum.

Growing to a compact six feet tall, this sunflower is notable for its heavy blooming, which begins in mid-summer. It is very hardy in zones 4 to 9 and makes a beautiful addition to both limited-space flower gardens and large containers. It will pleasantly focus attention on your garden

all summer. Being a complex hybrid, it is sterile and cannot form seeds; it is propagated only by cuttings. Your local larger garden centers should offer this plant for sale; however, if not, many online mail-order nurseries also provide it.

Male Contraceptive Practices

In continued efforts to reduce pollen formation, breeders have developed pollenless varieties in recent years. There is a genetic trait called “male infertility” in some lineages of sunflowers that prevents disc florets from forming pollen. That sounds rather like a form of birth control (in this case, seed control). However, the receptive disc florets still have the female pistils and stigma attachments necessary for full functionality, allowing them to form viable seeds.

The primary reason for creating no-pollen sunflowers is to cater to cut flower enthusiasts. Believe me when I say sunflowers can drop considerable amounts of pollen onto shiny, Pledge®-covered tables. Messy, but these new pollen-less types prevent constant cleanup.

I understand how this method is beneficial to the cut flower industry and for cleaner home furniture, but it does a disservice to pollinating bees that rely on the pollen for food. Fortunately, the nectar these sunflowers produce is not affected.

The Outer Limits



Recent novel forms developed have an even more surprising construction. One type, called **Sun-Fill Purple Hybrid** (which needs a new snazzy name), shown above, has the flower head radically transformed. The prominent outer rings of tough, bract leaflets or calyx are the dominant feature. They are purplish-green, while the usual circumference of “petals” is significantly reduced in size.

The remaining disc florets remain unchanged, as well as the fertility of the seeds. The effect is startling, to the point of being slightly repulsive, yet also delightfully intriguing. One can only speculate about the remarkable gene-bending developments that await us in future sunflower attractions.

There has been, and continues to be, appreciation for growing sunflowers, not only for their agricultural importance but also for their cultural significance. The following section highlights the diverse ways people have celebrated the beauty and importance of sunflowers in their lives.

Cultural Appreciation

You may not realize it, but that sunflower growing in your or your neighbor's garden represents years of appreciation across cultures and communities worldwide. It is an example of beauty, cheerfulness, and celebration.

Many other garden flowers are appreciated and honored in art and literature. Still, few achieve celebratory status in holiday celebrations. Roses are usually the selected choice of representing an honored occasion, but sunflowers? Can they become regional and community party flower honorees? Well, they are, and the celebrations can be delightfully wild and crazy.

“The Sunflower Is Mine.”

I cannot resist another plunge into an additional historical lesson. This topic involves art history. Once again, this will not be complicated, since sunflowers do not have a strong association with artistic endeavors. Still, there is a notable exception that you will soon learn.

The sunflower missed out on being the subject of literary fame. As noted in the Introduction, after 1500, when they were discovered as a food and religious resource in early North American cultures, relatively little was written about their beauty. It was introduced late, so that William Shakespeare did not know about them. Bill had plenty of other flowers to include in his plays and sonnets, but the towering sunflower was relatively unknown except to selected royalty showcased in their private gardens. We can only imagine what he could have written about these stately plants.

Eventually, a few later poets would pen comparisons of them to the sun, specifically finding solace in eternal light, radiant beauty, and resilience in overcoming despair and tragedy. Well, a little “good press,” at least in some poetry, is better than no written or spoken recognition.

If the written word was not conducive to showcasing sunflowers, they were eventually to be acknowledged by artists' brushstrokes and paint.

One of the earliest artists, Anthony van Dyck (1599-1641), a Flemish Baroque artist from Antwerp, painted "*Self Portrait with a Sunflower*" in 1633. This painting depicts Tony standing next to a single-stalked, large-headed sunflower. His head is turned towards us, the viewer, as he points to the sunflower with one finger, while his other hand holds a gold necklace around his right shoulder.

Needless to say, that is a mighty weird pose, and art historians still debate the meaning of his painting. For our purpose here, it records one of the first acknowledgments of a sunflower portrayed in a painting. Use your favorite internet search engine to view this colorful, but unusual painting.

The absolute best, and significant, artist who could paint a sunflower picture worth a thousand admirable words was the Dutch "emotionally complex" Post-Impressionist painter, Vincent van Gogh (1853 to 1890).

Vincent developed a passionate interest in painting sunflowers. He was obsessed with depicting their structure, especially their bold colors, which included vibrant yellow and orange. His major canvas works were displayed across France, as well as individual still-life paintings of flower heads. He told his brother Theo that he had become enamored with the colors and complexities of their structure. He even stated, "*The sunflower is mine,*" to lay claim to its intense beauty throughout its lifecycle.

As proof of his admiration for this plant, art historians state that he created 12 paintings of the flowers in various "poses." No matter what people thought of him, he always credited sunflowers with giving him a welcome but temporary "sunny disposition." He loved the color yellow because it represented joy and encouragement to him and other suffering souls like him.

Vincent endured several emotional problems throughout his life (culminating in visits to asylums and the unfortunate slicing off part of his left ear with a razor blade in an emotional tantrum with fellow artist Paul Gauguin in 1888). Ironically, Gauguin, who also painted a few masterpieces of sunflowers alongside Vincent, was quoted as saying that sunflowers were "*unequivocally Vincent,*" as a testament to how

those flowers became a symbol of Vincent's unique artistic style, characterized by thick, laid brushstrokes of brightly colored paint.

Vincent died on July 29, 1890, possibly by suicide, and at his funeral, his closest neighborhood friends and his brother Theo held bouquets of sunflowers as a tribute to him. Poor Vincent, he never sold a painting. Today, they are priceless.



"Sunflowers" By Vincent van Gogh - Digital photo by User: Postdlf, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=11887754>

Here is a bonus art-historical fact: Vincent painted four still lifes of sunflowers in Paris in the summer of 1887, and this one (*Sunflowers*) is shown above, courtesy of the Metropolitan Museum of Art. This digital image is the closest to what it appears in the Museum now. Notice how the colors appear, but they were originally brighter.

Today, Vincent's work (along with many other old paintings, including Leonardo da Vinci's *Mona Lisa*) has become darker over time due to the

degradation of the paint's oil, improper storage, or display. Their colors would have been brighter and more vibrant. Should art historians “repair” these great works to what they believe are the original bright colors or leave them alone? The heated debate continues.

Festivities and Celebrations



It's one thing to grow and admire a few sunflowers in a garden, but it's another when viewing fields of them all in bloom, pointing eastward. Sometime in midsummer, festivals celebrating the profound blooming occur throughout many places in the world. The United States, Canada, Japan, Europe, and even Thailand typically host several sunflower carnivals in various locations, often on large farms. Some Asian locations will associate religious or philosophical aspects with these celebrations.

Interlaced with the sunflower field observation are food and souvenir vendors, farm animal petting, corn mazes, and other entertainment

venues. I hate to be a pessimist, but today you have to offer massive amounts of food and various forms of entertainment to get anyone to attend a botanical event. Seeing thousands of sunflowers spectacularly highlighted by the rising sun, or being backlit by a setting sun, is it not enough?

It isn't easy to list all the festivals from all participating countries here. It is best to plan and research if there are any events in the area you're planning to visit during midsummer. Some festivals begin when peak blooming commences and last for a few days (usually a weekend) or longer.

Attending at least one of these events, no matter where, can become an entry into your "bucket list" aspirations before you "*shuffle off this mortal coil*" in the words of William Shakespeare. Before hopping into the car or plane, it is best to make plans and arrangements, as things may and will go wrong before or upon arrival at the big event.

Although your main aim is to visit where these large fields of blooming sunflowers are located, you should first determine when the sunflowers are at their perfect blooming time. Like your garden display of sunflowers, which can last for a few weeks, these events are usually timed to coincide with their peak display or at a specific time in summer. Once you know the best time to visit, you can proceed with the actual physical planning phase on how to get there.

When determining where and when to visit, it is best to scout out other nearby attractions, such as those in a nearby city, to make your trip really worthwhile. You need to remember that airports and hotel stays are not common in or around farm fields. This also suggests investigating transportation necessities, such as renting a car, where to park, or whether the festival provides public transportation to and from the event at certain times.

Speaking of times, the best view of a field of sunflowers is at sunrise. Plan to secure the best viewing locations. Also, never neglect Mother Nature's finicky nature. Although it may be cloudy (or rainy), the sunflowers will still be facing east. Can't make it to the morning venue? There is nothing wrong with taking in the magnificent sight of the

sunset vista, with sunlight backlighting the blooms. That is a bonus extravaganza of viewing those beautiful flowers.

Bragging Rights

No matter where you travel to view large fields of sunflowers, some festivals and attractions tend to rightfully brag about being the best location or the most significant showing of fields of blooming sunflowers. Well, that's fine, but when it comes to growing the quantity of these plants, nothing surpasses the breadth of land areas than certain countries or specific land areas.

Ukraine leads the world in growing sunflowers, followed closely by Russia. The entire Ukrainian landmass is highly conducive to growing these plants, thanks to fertile soil and adequate summer rainfall. Even the winters are not as brutal as those in Russia, so spring seed planting is more reliable. Russia comes in a close second, but it is worth noting that it has a larger land mass. Still, the overall climate is harsher and colder than in Ukraine. It is suggested that both countries together account for over half of the world's sunflower seed harvest.

In a cultural context, particularly relevant in the ongoing political strife with Russia, sunflowers hold deep emotional significance for the Ukrainian people. These plants are regarded as symbols of peace, solidarity, and peace. As of this publication date, the war with Russia continues, and though rarely viewed or reported, the sunflower represents a unified symbol of resistance and strength.

Other countries also produce bountiful sunflower crops, though in much smaller quantities than Ukraine and Russia. Argentina, China, Turkey, and the European Union members, including Bulgaria, Romania, and France, are among the other top contributors.

What about Canada and the United States? No, they are far down the line in producing any sizable sunflower crops. That being said, the US still does not grow a paltry showing in sunflower harvests each year. North Dakota leads the nation in seed production, followed closely by South Dakota, with both states harvesting a billion pounds of seeds

annually. The projection is for increased amounts in the years ahead for several reasons that will be reported in the next section.

Other US states, especially those in the Great Plains, account for a significantly smaller amount of harvesting, but it all adds up to a respectable total yearly output by US farmers. Although the state motto of Kansas is “The Sunflower State,” it is not a major player in seed production; however, the wild sunflower represents the state’s significance in its agricultural heritage. Even today, wild stands of sunflowers dot the fertile plains landscape. Many people may think they are “weeds”, but to a Kansan, they represent pride, thus being the official state flower. Now, that’s something to brag about!

Sustenance and Sustainability

Now we come to the gist of this ebook, which concerns all the excitable commotion, fuss, and attention these plants have been noted for, and that still resonates now and into the future.

Sunflowers, surprisingly, are of great economic importance. They contributed to the formation of what are now superpower nations, involved in times of war and peace, and ultimately provided food and advanced nutrition to countless people. But there are several other benefits that sunflowers offer for everyone, even though we rarely, if ever, know about them.

Sunflower seeds are considered a superfood by several nutritionists due to their exceptional nutritional profile. The seeds provide high levels of protein, fiber, and multiple vitamins, especially vitamin E, which is an antioxidant that protects our cells from environmental damage.

The oil is also considered a major heart-health product that helps reduce bad cholesterol (LDL) while boosting good cholesterol (HDL). This can significantly help you if you take any high cholesterol medications. As always, it is best to talk to your doctor if you begin consuming more sunflower oil and seed products. Remember, consume anything in moderation!

The following sections provide an overview of the various ways sunflowers are surprisingly useful and contribute to our well-being, safety, and overall enjoyment. Prepare yourself to be amazed!

The Heart Of It All

Alright, I get it. By now, you are practically tired of reading about sunflower oil over and over. It has been covered in almost all the above sections. But, it is a recurrently important subject that determines sunflower cultivation.

OK. So why is this oil so darn essential? Well, the black-seeded varieties are the primary source of cooking oil for most people, especially in

Europe, except in more Mediterranean areas, where olive oil is used. It is considered by dietary health professionals to be a very healthy oil, with low levels of saturated fat and high levels of Vitamin E. It can be used for many culinary purposes, such as baking, frying, and as a salad dressing. It is regarded by health professionals (specifically cardiologists) as helping lower cholesterol levels, making it a heart-healthy option for food preparation.

You would be mistaken if you thought all countries and people used this oil for their food needs. Here in the United States, it can be challenging to find this oil in grocery stores. The US relies more on corn, olive, and “vegetable oils”—a catch-all term that usually refers to blends of soybean, canola, and peanut oils. Then there are lesser-used coconut and palm oils, along with the animal fats tallow and lard.

Something amazing occurred in the 1990s when sunflower oil suddenly became the darling of the snack food industry. The above-listed oils and fats, when repeatedly heated during frying, transform into high levels of harmful hydrogenated trans-fats. The Frito-Lay Potato Chip company discovered that frying potatoes in sunflower oil retained the oil's health benefits. It begs the question: if potato chips can actually be good for your health (except for the over-applied salt), why isn't this oil offered more widely in grocery stores? Well, one answer is that there are “food oil wars” over price, ease of obtaining, and the processing of these oils.

Buttering Us Up

Black-seeded sunflowers are outstanding for their high oil content, while the gray-striped seeds produce much less. Even so, these seeds (actually, the edible kernels) can be repeatedly crushed until a semi-solidified slurry forms and a buttery appearance develops. Peanuts most often come to mind to make (what else?) peanut butter. Well, can sunflower kernels do the same? YES!

Not many people know about sunflower seed butter, but it exists. In 2003, a company in Fargo, North Dakota, called SunButter®, in association with the USDA, developed a sunflower seed spread. It has a close resemblance to peanut butter — maybe a deeper shade of brown — but it has a surprising, yummy flavor. To my taste buds, this

delightful spread tastes like tree nuts—specifically hickory nuts or almonds. Yes, that was my instant flavor identification when first sampling this spread. I grew up eating hickory nuts because of the trees near my boyhood home.

This spread is delicious, and the best part is that children and adults who are allergic to peanuts (and tree nuts) can safely eat it. The SunButter® company processes only quality roasted sunflower seed kernels — nothing else — in its factory, so this spread is allergen-free. The product is also GMO-free and contains plenty of protein, vitamins, and minerals, comparable to, if not exceeding, those of quality peanut butter.

So, why did it take me — and probably you, after reading this ebook — to learn about this buttery spread sooner? That’s complicated to answer. One reason I discovered is that supermarkets practically hide this SunButter® spread on their shelves, if they offer it to the public at all. Many smaller food markets offer only peanut butter, but larger store chains may sell it; you have to hunt for it amongst the wide variety of peanut butter products.

I found this spread on the very bottom shelf — considered “no man's land” in grocery stores — because people rarely look at products on the very bottom or top shelves. Only two one-pound jars remained and must have been there for ages, since they had a film of dust on the lids and were nearing their sell-by dates. No matter, I purchased a jar and sampled it spread on Ritz crackers once I came home. I was immediately hooked. It’s now my favorite spread — a bit more expensive than peanut butter — but I don’t care; I love it, and that’s that.

A Snack Between Meals

Sunflower seeds (either the entire hard-shelled achenes or the inner kernels) are also offered in a variety of snack food products. For the life of me, I do not understand “eating or chewing” the seeds that retain the shells or hulls since you have to spit them out. I guess I am prudish since I really detest spitting those masticated shells and watermelon

seeds, for that matter. I even hate the word “masticate”. Do not swallow the hulls, for they can cause severe digestive problems.

The inner roasted kernels are used in products such as trail mixes, granola, and protein bars. While you are at it, feel free to add a generous amount to salads and your morning bowl of corn flakes, oatmeal, or bran.

As for all those snack products available in grocery stores, try to cut back on those with high levels of sugar and salt. The oils may help your heart, but excess sodium can raise blood pressure, which is bad for your heart, blood vessels, and kidneys. The high sugar levels can be dangerous to people with diabetes.

Birds Of A Feather...



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Until now, this ebook has focused on human consumption of sunflower seeds and oil, but in a more realistic perspective, we really don't give sunflowers much thought until we feed our "feathered friends" — the neighborhood birds.

Here is where we (especially us "birders") take more notice of purchasing sunflower seeds, or of growing several sunflower plants in the flower garden. They are not only for our visual pleasure, but also in seeing different bird species "stuffing their crops" with these seeds at feeder stations near the house. These seeds are considered a superior superfood for these avian visitors, especially during the lean times of the cold, wintry months.

How did this interaction between sunflowers and bird feeders begin, or, in a more curious fashion, WHY did it happen? Time for another "off-center" history lesson.

For most, if not practically all of recorded history, the idea of "feeding the birds" would be considered insane. After all, birds have always been competitors for our food, such as grain and fruit. There have been religious or spiritual reasons that feeding pretty birds became an acceptable practice. One such occurrence is in ancient Hindu texts (about 4000 years old) that describe feeding birds as a spiritual activity. It was based on karma — that balancing act of what goes around, comes around. If you deliberately killed, let's say, a bug, then you did a bad thing. To offset the "karma is going to act revengeful toward you" eventuality, feeding birds (or any other animal) would grant you a better fate, offsetting doing something bad with doing something good — make that, very good. This actually sounds reasonable.

Well, nothing significant happened later in the history of bird feeding until the late 19th and early 20th centuries, when feeding and housing wild birds became a hobby for bored suburbanites. Publications were printed, allowing people to identify the various birds living (and now feeding) near their house.

Then, in the 1960s and 1970s, the environmental movement took hold, teaching people to watch birds and feed them. It was (and still is) a novel form of outdoor interactive entertainment, but for indoor viewing

enjoyment. Gee, that sounds like watching football or baseball games on TV. Here, it is watching birds eat. It sounds absolutely crazy, but lots of us do it.

New commercial markets of feeder and birdhouse designs encouraged people to purchase them, including something really radical — bagged birdseed. And all this has increased in popularity, sales, and enjoyment for all concerned.

Here in the US, a large percentage of blackseeded sunflowers are grown for bird food. As explained earlier, these thin-shelled seeds contain more high-energy oil and protein than the larger, thick-shelled, gray-striped seeds. Many birdseed bags contain additional seeds, such as millet and cracked corn. Still, many birdwatchers feel that these mixes are a waste of money for the majority of birds that “instinctively” pick out and eat only the sunflower seeds. The remaining seed mix material is “beak-brushed” outward from the feeder and left to rot on the ground. It then attracts unwanted critters such as mice, raccoons, opossums, and, in some locales, bears. Oh my! Fortunately, no lions and tigers.

Even spent black-seeded sunflower seeds can fall to the ground, creating a mess over time. Some birdseed companies have gone a step further by pre-hulling the seeds and offering bags of only the kernels. These bags are, obviously, higher priced than the regular bagged black seeds, but there is no mess, and practically all those kernels are eaten by the birds. That’s something to consider if you live in rented condominiums or other dwellings that do not permit outstanding messiness.

A Biomass Of Biological Biodiversity

Until now, everything described about sunflowers has concerned their history, beauty, and the food products made from their seeds. In fact, these plants have provided us with more than a food resource. They continue to be tools to make our lives safer and healthier even after their death.

Not many plants like these can provide a lengthy resume of their contributions to helping stabilize our problematic health, cultural, and environmental concerns. In the following few sections, you will witness how these plants make our world a safer and more beautiful place just by utilizing their entire structure.

Setting Down Roots

Ever since realizing the advantages of growing sunflowers, we have also discovered that these plants are not particular to specific growing conditions. They can adapt to stressful environmental fluctuations, such as arid, low-nutrient soils.

As long as the sun shines, there is occasional rainfall, and the plants complete their lifecycle before a killing frost, there is nothing much to be concerned about. Well, except for the ever-present worries like disease, insect damage, and hungry birds. Overall, it's about dropping seeds in the ground and hoping the crop grows well (with nature's kind assistance). This attitude and planting method mirror those of all other major crops — especially cereal grains — to sustain community and regional food requirements. Hey, that is a major big deal for such a beautiful flower garden resident.

Being able to grow in drier and less-than-ideal fertile loam, the unseen root system is actually extensive, spreading downward and outward to obtain whatever moisture and minerals can be absorbed. This activity is essential for stabilizing potential soil erosion. The root system actually expands into hard, compacted soils, opening up an area for better (and quicker) rainwater absorption. Mother Nature is such a wizard in hydrology.

Since many sunflower species are annuals, this extensive root system helps to enrich the soil with minerals that other crop plants can utilize long after the roots die and rot. This activity is vital to crop rotation practices, significantly reducing the risk of future soil-borne fungal and insect diseases.

Another advantage of growing sunflowers in less-than-ideal areas is that they attract essential insect pollinators, such as native bees and butterflies. The flower heads contain enormous amounts of pollen and equally generous quantities of nectar to support a multitude of these insects. By enticing these insects with a cornucopia of abundance, they are also available to help pollinate other plants blooming in nearby areas.

A Sunflower To Dye For

The Hopi Culture, fortunately, did not die out entirely after the invasion of European conquistadores, as reviewed in the early section of this ebook. Over generations, their ways of living continued to be practiced, including the usage of one very special variety of sunflower. Today, it is called the **Hopi Black Dye** sunflower, for it is extremely valuable for producing various shades of dye to color woven baskets and natural fabrics such as cotton and wool.

The multitude of seeds contained in a large flower head are deep black, described as ranging from obsidian black to the darkest purple imaginable. The simple process for extracting these colorants is to pour boiling water over the seeds in a bucket or, in olden days, in earthenware vessels. The seeds, by the way, are not “whole seeds” but the seed hulls for the inner kernels are too valuable as a food resource. Yes, it is — or was back then — a laborious process to hull the seeds, but today many dyers just use the whole seeds to save time and labor.

The dried basket grass or reed fibers and the cotton or wool yarn were then added to the blackened water and allowed to absorb the colorants. The expected coloration depended on the length of the soaking. To permanently absorb the colors (called “fix” or “washfastness” to prevent fading after future washings) into the yarn, a natural compound called a mordant was added to the boiled water. One

common mordant was (still is) alum or iron powder. Other mordants help change the water color to pastel tones by altering the pH with lime or an acidic compound.

This dyeing process is a complex procedure to undertake and describe, especially when I don't really know what I am writing about. Still, several websites specifically teach you (along with photos) on how it is all done. With practice and the use of certain mordant mixtures, the Hopi and you can create many permanent color variations ranging from deeper to lighter shades of gray, red, purple, lavender, blue, brown, and the ultimate black.

Another colorant used to color baskets and yarn was the bright yellow petals of the sunflower head: the more boiled petals were added, the more vibrant the color became, ranging from yellow to orange.

The Hopi Black Dye sunflower seeds can be purchased in many online nursery catalogs, especially those that offer native or wildflower seeds. You will be amazed at how black those seeds are and the ultimate beauty of the blooming sunflower.

Everything Except The Kitchen Sink

When you think nothing more can be expected in growing sunflowers, think again. The following list of added advantages in sunflower cultivation will undoubtedly amaze you. Some are self-explanatory, so I have decided to limit additional details, except to highlight recent advances in working with these plants.

Every sunflower grown eventually ends in its death. After the flower head is gleamed clean of seeds, all that stands is a “backbone skeleton” of tall stalks and branches with withered, dried leaves. Even the Hopi people (and subsequent generations of Europeans) saw great use for these remaining structures. The stalks, when viewed, are strong and tough. They have to be to support the weight of the seed-filled flower heads. But the stalks are almost indestructible! The next time you come across the central stalk, try to push down on it with your foot. You will have a difficult time doing so, if you can.

Well, what can be done to get rid of it? Long ago, poor farming folk would slowly chop down these stalks with hatchets or axes. Slowly is the operative word, for it was a laborious process. The stalks are stiff and fibrous, making clean cuts difficult. Today, chainsaws make work go much faster.

The ultimate plan in the past was to dry the splintered and sectioned stalks and use them like wood to burn in fireplaces for the winter. Yes, it can be done, even for you. The dried leaves also act as paper tinder to help begin a fire. You may think a sunflower stalk would not produce much heat, but it does. It has historically helped poor Russian farm families living within forests of dead sunflowers without immediate access to wood to keep warm over the winter.

Even the spent, scratchy flower heads would be burned, but they also served the double duty of being handy, disposable scrubbing pads to clean food residue off plates. Maybe not as efficient as a Brillo Pad, but it has been done before.

But wait — there's more! If you don't want to burn the stalks, you can use them as very sturdy and efficient support poles for a variety of simple building projects. Hopi and other Native American cultures would use the stalks (especially the prized taller ones) as support poles for making small teepees. This was especially valuable when living in areas void of tall trees.

Suppose you are not interested in teepee making (not many of us are today). In that case, you can use the stalks as makeshift supporting poles for climbing plants such as sweet peas, pole beans, and morning glories.

The creative ideas used today are outstanding when using discarded dead sunflower stalks. As described a few paragraphs earlier, the stalks are firm, durable, and "almost" rot-resistant. What happens when these stalks are ground into miniature chips or dust? The result can be forming a plywood-like sheeting material or a finer fiber-compressed fiberboard. These super-strong sheeting boards are used today for home improvement projects, such as kitchen cabinets, and for low-cost, sturdy furniture. Maybe not as impressive as oak, maple, or hickory

furniture, but remarkable in its own right by being made from sunflowers.

Finally, not all those black sunflower seeds (having the highest oil content) are processed into cooking oil. A small percentage is used to produce eco-friendly biofuels. A biofuel is any natural renewable energy source made from a high-energy-containing oil or fat. These oils are converted into ethanol, which is usually added to gasoline or diesel. Sunflower oil is generally converted into ethanol, which is then blended with diesel to form biodiesel for transportation and heating. I know — it's very complicated. Corn and soybeans have been converted into ethanol for several years now. Still, sunflowers are also in play to help reduce fossil fuel dependence in many regions of the world. The next time you pump gas into your car, SUV, Jeep, or truck, some reengineered sunflower oil is going into your tank.

No one would believe it, but all these various applications used by growing sunflowers are surprisingly true! But there are some bizarre practices involving living sunflowers that question belief as well, and they are described next.

The Cleaning Crew

One of the strangest yet environmentally vital uses of sunflowers is their ability to clean up heavy metal and radioactive-contaminated soil and water. Environmental scientists discovered sunflowers growing exceptionally well near the Chernobyl nuclear power plant accident in the 1990s. They wondered why they were not dead or “growing genetically weird” because of the excessive radiation. What the scientists discovered was even stranger: the plants absorbed radioactive elements from the soil and from nearby contaminated waterways. Other plants nearby died, except for the common, but now wild-growing sunflowers seemed to thrive.

The scientists also experimented with growing sunflowers in contaminated ponds and lakes using specialized hydroponic methods. They inserted the seeds into floating, fibrous mats or rafts, allowing the root system to extend into the water. Surprisingly, the growing plants absorbed more radioactive elements than those growing in the soil.

So, what became of all these plants? They were not allowed to bloom so as not to transfer radioactive nectar and pollen to bees and butterflies, or allow seeds to form, to prevent birds from feeding on them. Before blooming, the technicians harvest the plants, dry them, pulverize them into a powder, and store them in containment vessels for later permanent deep-burial out of harm's way for who knows how long. They only harvest the top growth, leaving the root system intact. It is too dangerous to uproot and disturb the contaminated soil. If growing time is sufficient, they sow more seeds to allow additional plants to grow and absorb even more radioactive minerals.

Years later, sunflowers were (and still are) planted in other radioactive areas, including the 2011 Fukushima, Japan, nuclear power plant disaster.

Other scientists discovered that specific hybrid sunflowers absorb heavy metals (such as lead) from contaminated soil. This is especially important in inner-city environments, where old houses and businesses still contain lead-based paint and other heavy metals that pollute the ground.

Why are sunflowers so prone to absorbing such harmful substances? Environmental scientists call them "hyper-accumulators" because their large leaves and excessively long, thick main stalks easily absorb those dangerous substances. A few other plants act the same way, but do not have the size, bulk, and rapid growth that sunflower plants can provide to absorb these harmful substances.

Using sunflowers to "accumulate" contaminated soil and water is highly cost-effective. It would be highly costly (over one trillion dollars annually) to excavate the soil and pump out water for decontamination. Sowing sunflower seeds and eventually harvesting and processing the plants costs a small fraction of that amount.

Since the Chernobyl disaster, Ukraine has become a nuclear-free country. The sunflower has become their national flower, symbolizing hope for a peaceful, safe future. That is, until the spring of 2022, when Russian President Vladimir Putin invaded Ukraine. Systematically, he has destroyed cities, towns, and villages with untold numbers of deaths

and suffering. His military took over and occupied (absolutely crazy) the Chernobyl area, including the highly radioactive power complex.

What the future holds for the people of Ukraine is unpredictable at the time of writing this ebook. In some small but heartfelt gesture of support for them, the world sowed and grew more sunflowers. Maybe these beautiful plants can absorb toxic behavior and actions. Alas, we can only wish they could. Maybe, for a little while, if everyone were to stand facing west on an early, mid-summer morning and view acres of blooming sunflowers and admire their profound beauty, all that tension, stress, anger, and relative hopelessness would instantly disappear and be replaced with kindness, admiration of Nature, and overall joy. A few minutes to absorb these feelings would do us all a world of good.

The Future Is Now

It's not every day that we would dwell on the future of a particular garden flower that, due to its large, edible seeds and massive stems, has gained significant agricultural and economic importance. Like any worldwide-grown crop, its future mirrors our own.

If we look into a crystal ball and see what lies ahead, we will notice that what is happening today with this plant is sure to continue, though in some ways it will be even more so. According to some prognosticators, demand for sunflower products listed earlier will increase. More oil for food preparation, increased biofuel and building material production, and the restoration of polluted habitats will surely be realized. Other advances in unlocking sunflower "super powers" will grow in areas such as pharmaceutical and cosmetic applications, which are only now being recognized.

Even space travel possibilities and applications were, and still are, analyzed and studied using sunflowers as test subjects. Seeds have become occasional companions to astronauts on various missions, including current ones on the International Space Station. Seeds were germinated in zero-gravity weightlessness to observe how the seedlings would grow. They apparently grew fine — if not a bit confused (who wouldn't without gravity) — which proves that growing food plants like lettuce, beets, tomatoes, onions, peppers, and, hopefully, potatoes can be accomplished for extended space missions.

Here on Earth, though, we still have to address current challenges involving land use and political unrest. Sustainable agriculture amid increasing climate change will be a top priority. Sunflower cultivation will become increasingly crucial for drought resistance and adaptation to rising environmental temperatures.

Part of that cultivation will include more advanced work in genetics. Like all other plants, sunflowers have to constantly adapt genetically to new strains of viral and fungal diseases and to constant insect damage. With over 70 wild species available to geneticists, there are plenty of

“new blood” genes available to focus on adaptability to many environmental threats.

As the years pass, political strife and tensions will (no surprise) continue. It’s always the same tune but with different lyrics and singers. Depending on the situation in Ukraine, sunflower harvests will fluctuate there, but the farmland should remain.

Other areas in the world will continue growing sunflowers in whatever manner the seeds are destined for consumption. A few countries in Africa are major players in sunflower cultivation and processing, as they are well-suited to sunflower cultivation. The United States, however, is forecast to become a less significant grower but will still lead in genetic research. Go figure.

No matter what forecast or prognostication is bandied about, the key to sustainable sunflower growing and harvesting for our benefit is the ultimate benefit to the pollinators — all the bees and butterflies that can thrive in fields of the flowers. Unfortunately, the populations of these beneficial insects are dwindling worldwide each year.

The cause or causes of this decline are debatable. We have encountered a dire dilemma. Few absolute facts are determined, and thus, the remedies are also questionable. Without a large and exceptionally stable population of these insects, all crops of these flowers and many other food-based plants will decline and possibly end permanently.

The future is now, and we’d better choose the correct path to a better tomorrow.

Conclusion



“Advice from a sunflower: Be bright, sunny, and positive. Know your roots. Spread seeds of happiness. Rise, shine, and hold your head up high. Keep on growing. Even on the darkest days, stand tall and find the sunlight.” — Unknown.

Vincent van Gogh was a visionary, though sometimes a bit confused and temperamental. In his mind and eyes, the sunflower represented strength, endurance, and resilience, especially in problematic times, which is, unfortunately, always.

Let’s keep these ideals always in our hearts and minds as we view one sunflower blooming in a summer garden or thousands in vast fields.

Thank you for reading this ebook.

I hope this publication has enlightened you to the many ways and means of sunflower history, growth, and products. My primary purpose in this ebook is to help you appreciate the profound beauty of this wonderful overgrown daisy.

Please visit my author website, <https://gedwinvarner.com> for information about my other gardening ebooks and contact information.

About the Author

G. Edwin Varner grew up on a farm, helping his father in the crop fields and assisting his mother in the flower and vegetable gardens. This experience and learning led him to receive a Bachelor of Science degree in Biology with a minor in Botany.

He successfully owned and operated a fragrant-flower mail-order nursery for 20 years. Unlike most mail-order nurseries, which publish colorful but expensive pictorial catalogs, his frugal catalog extensively described the flowers he grew. He once said, "I write a thousand words worth a picture in my catalogs." Today, he has the same writing style (thankfully with fewer words) across a variety of enjoyable and informative ebooks. This time, the ebooks include color photos of each flower.

He encourages you to cultivate something unique and beautiful in your gardens. His motto is "Read about it, see it, grow it, and enjoy it!"

G. Edwin Varner lives in a rural area of northeastern Ohio, USA.