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Title of Entry: Standing Tall In The Sun

Sub-Category: Essays

Local Games: Haywood County Senior Games

Standing Tall in the Sun

After a morning of working in the school garden, I was taking a break when a small boy raced around the side of the building straight for the garden. Before I could get up, he stopped quickly in front of the very tall sunflower plants and began to tilt his face up. "Ooooh" was all that he said as he stood turning his face further and further up to see the flowers on the seven-foot stalks. It almost seemed that he would tip over backwards as he looked up at the flowers bobbing in the gentle breeze.

Just as quickly an older boy came and stood with the small boy. "What are they?" asked the small boy. "Sunflowers, they plant them every year," answered the older boy. "Why?" asked the small boy. "I guess..., well they just look different and tall. Come on we have to go."

Why do we plant sunflowers every year? The sunflowers planted each year and the one that the children most enjoyed was the very tall, large-flowered *Helianthus Annuus*. Each seed will produce one tall, thick stem with a huge yellow flower at the top. The yellow flower has a large, seed-bearing center holding hundreds of seeds.

My curiosity led me to do some more reading to learn more about *Helianthis Annuus* considered the "bold and beautiful" plant of the garden! The tallest sunflower was recorded at 30'1" and was grown in Karst, Westfaken, Germany. The largest sunflower head was grown in British Columbia and was thirty-two inches across. As a contrast the smallest sunflower was grown by Michael Lenke of Lake Oswego, Oregon. It was 2 1/5 inches tall and was grown in 1985 using a patented bonsai technique. (2021 Guinness World Records)

Aware of all the many objects with sunflower designs, led me to The National Sunflower Association website. With all the uplifting emotions attached to the sunflower, one of the frequently asked questions of The National Sunflower Association is "Why is the sunflower such a popular subject of artists?" Their response sums it up well: The sunflower plant has almost 'human-like' characteristics and dimensions. The face of the blooming sunflower can almost speak to you. For this reason, the sunflower was a favorite subject for Europe's greatest artists such as Van Gogh and Picasso. Sales of

these paintings can bring millions of dollars today. The sunflower continues to be a favorite art form for designers of fashion to the everyday coffee mug. It has, and continues, to stand the test of time.

Planting sunflowers near a dwelling was at one time thought to prevent certain diseases. Just as sunshine suggests warmth and positive thoughts, so do sunflowers. Many times, they are included in bouquets to celebrate joyous occasions and to convey emotions such as happiness, warmth, luck, adoration, and friendship. If you are going through a challenging time, having sunflowers in a bouquet is said to lift your spirits.

(www.appleyardflowers.com)

Not only did sunflowers make an emotional difference in the lives of people, but sunflowers were used for food, animal feed, medicine, oil, and fiber. The seeds could be ground or pounded to make flour for making cakes, mush, or bread. The tall thick stalks were valuable for their fiber content.

There are many words that can sum up the history of the sunflower, but amazing seems to be the best. The National Sunflower Association gives this description of the early history of the wild sunflower: the sunflower is native to North America, but commercialization of the plant took place in Russia. It was only recently that the sunflower plant returned to North America to become a cultivated crop. But it was the American Indian who first domesticated the plant into a single headed plant with a variety of seed colors including black, white, red, and black/white striped.

The history of the sunflower involves much travel across the Atlantic Ocean from North America to Europe with Peter the Great to Russia back to North America and back to Europe.

Archeologists have discovered that sunflowers have had a long history in the Midwest and Southwest regions of the United States. With the sunflower so prevalent in the area it is no surprise the state flower of Kansas is the sunflower. We have also learned that due to the perfect growing conditions in Ukraine their national flower is the sunflower.

Whether out of desperation or curiosity much has been learned about the sunflower from people who have carefully tended this wildflower to its status as an important agricultural plant. Through the years (beginning as early as 3000 BC in present-day Arizona and New Mexico and before the domestication of corn) resourceful people have found that the sunflower seeds were good to eat, oil could be extracted from the seeds, and parts of the plants could be made into medicines, dyes, and fiber.

Native American tribes shared the seeds of this plant with Spanish explorers around 1500 who returned home to share their new treasures. As the plant and seeds traveled around Europe additional processes for use were discovered. By 1716, an English patent was granted for squeezing oil from sunflower seed.

Sunflower gained in popularity as a cultivated plant in the 18th century. Peter the Great and Russian farmers are credited with this gain in popularity. Mostly an ornamental plant until 1769, the sunflower literature mentions sunflower was cultivated for oil production. By 1830, the manufacture of sunflower oil was done on a commercial scale.

By the early 19th century, Russian farmers were growing over two million acres of sunflower. During that time, two specific types had been identified: oilseed for oil production and non-oilseed, for direct human consumption. Both are grown commercially.

The popularity of the sunflower brought it back to North America by 1880 when seed companies were advertising the "Mammoth Russian" sunflower seed in catalogues in North America. A source of this seed movement back to North America may have been Russian immigrants. The first commercial use of the sunflower crop in the United States was silage feed for poultry. The Missouri Sunflower Growers' Association participated in what is likely the first processing of sunflower seed into oil in 1926.

By 1930 Canada was actively breeding sunflower. The amount of acreage in sunflower increased because of demand for sunflower oil. Acreage spread into Minnesota and North Dakota. Acreage continued to increase in the United States with commercial interest in the production of sunflower oil.

Then as the need for sunflower oil grew on the North American continent in the 1970's hybridizing of the sunflowers provided higher yields and enhancement of the oil as well as disease resistance. Commercial production today continues in the Dakotas, Minnesota, Kansas, Colorado, Nebraska, Texas, and California.

The two types of sunflowers grown commercially today are:

Oilseed – small black seeds remarkably high in oil content and is processed into sunflower oil and meal. It is also the seed of choice for most bird feeders.

Non-oilseed or confectionary sunflower – larger black and white stripped seed used in a variety of food products from snacks to bread.

Sunflower oil is an unsaturated fat. It is a source for both monounsaturated and polyunsaturated fat. Unsaturated fat is recommended as part of a heart healthy diet. (*American Heart Association*) Sunflower oil supplies more vitamin E than any other vegetable oil.

An important question to many people concerns genetically modified foods. Sunflower is not a genetically modified plant (non-GMO). Europe is a large production region for sunflowers and the European Union will not accept GMO planting seed. The regulatory hurdles in the United States are insurmountable at the present time due to possible gene flow to wild sunflower. Without Europe and the United States there is not enough market size for the private sector to make the necessary investment in sunflower GMO.

One of the lessons we share with the children on sunflowers is the unique ability of sunflowers to turn their flowers towards the sun. When you really stop to think about it, that is an amazing quality for a flower so heavy with seeds. A young sunflower's sun-tracking is called *heliotropism*. "Light from the sun provides the solar energy used by plants for photosynthesis. *Heliotropism*, or solar tracking, is when a plant follows the movement of the sun during the day. Rooted in ancient Greek, "*Helio*" refers to the sun and "*tropism*" means a turning or movement of a living organism toward or away from an external stimulus, such as light, heat or gravity.

“The sunflower (*Helianthus Annuus*) is the best example of a plant that displays this phenomenon. Young sunflower plants follow the sun from east to west during the day and then, reorient themselves during the night to face east in anticipation of the sunrise.” “Increased light capture improves plant performance with more leaf area and increased biomass.” (“*What is Heliotropism?*” extension.wvu.edu, June 1, 2021)
Pollinators are also attracted to warmer surfaces so pollination occurs more efficiently.

Although my garden visitors on that warm summer day were not sure why the sunflower was planted there each year, I now have a much better understanding of why we plant *Helianthus Annuus*. Not only is it a beautiful plant to observe and enjoy, but one greatly beneficial to many people and birds. And perhaps, just perhaps, some future scientists or farmers may find a still more impressive gift from the sunflower plant to benefit all humanity and the animal kingdom as well.

Information for this essay was resourced by:

Albert A. Schneiter, ed. Sunflower Technology and Production, (The American Society of Agronomy No. 35, 1997) 1-19.

American Heart Association

“What is Heliotropism?” www.extension.wvu.edu June 1, 2021

www.appleyardflowers.com

www.sunflowernsa.com/all-about/history/ National Sunflower Association