

Sunflowers - A Paddock of Solar Panels

“Sunflowers end up facing the sun, but they go through a lot of dirt to find their way there.” — J.R. Rim



When sunflowers blossomed in Gavin Sinclair’s paddock, he describes the buzzing of insects as incredible. Like "smart" solar panels, the whole head of the sunflower can turn towards the sun, maximising reflectivity and thus attracting more pollinators.

Sunflowers are of the *Helianthus* genus which comprises about 70 species of annual and perennial flowering plants in the daisy family, Asteraceae. Except for three South American species, the species of *Helianthus* are native to North America and Central America. *Helianthus annuus* is the common sunflower which is planted from patios to paddocks.

Our Resilient Farms Agronomist, Jade Killoran, says: “Sunflowers are an edible broadleaf, which when the head fills with

seed are full of high quality oil which is great livestock fattening feed. They are palatable to sheep and cattle alike and also draw nutrients and minerals from the subsoil as they have a decent taproot.

From an environmental perspective, sunflowers attract beneficial insects, which helps reduce pest outbreaks, their taproots help open up soil, and they host mycorrhizal fungi.

They are best sown from September onwards as they are a summer active species. Common sunflowers are quite cheap and only 2-4 kg is needed in a mix. They are fairly drought tolerant and offer shade and scaffolding for smaller plants, and for twining plants such as vetch, peas etc to climb up.

They are also aesthetically pleasing, and some farmers have started to use them as an extra income stream - people like to take photographs in the sunflower paddocks.”



Sunflowers as Crops

Native American people grew sunflowers for their edible seeds and oil from Mexico to Southern Canada from as long ago as 5000 years. In the 16th century the first crop breeds were brought from America to Europe by explorers. It was in Russia that they were developed for their oil production and first grown on an industrial scale. Russia remains a principal producer of sunflower seeds, topped only by Ukraine which in 2018/2019 produced 15 million metric tonnes of seed.

Healthy for cows and you too!

Some scientific sources, notably in the USA and Kenya, claim that sunflower oil in the diet of a dairy cow can improve yield and the quality/quantity of milk fat.

Oily sunflower seeds have long been known for their health benefits for humans. They're rich in healthy fats, beneficial plant compounds and several vitamins and minerals. Thanks to these, they are said to boost your immune system and energy levels.

According to Healthline, an American health website:

“These nutrients may play a role in reducing your risk of common health problems, including inflammation, heart disease and type 2 diabetes. Sunflower seeds are especially high in vitamin E and selenium. These function as antioxidants to protect your body’s cells against free radical damage, which plays a role in several chronic diseases. Additionally, sunflower seeds are a good source of beneficial plant compounds, including phenolic acids and flavonoids — which also function as antioxidants.”

Native Americans used sunflowers for its seeds, food and medicine. They used to extract juice from its stem to treat wounds while its water infusion was used to treat kidney ailments. There are images of sunflowers on the temples of the Andes mountains and in some parts of the Americas it was traditional to keep bowls of sunflower seeds on the graves of the deceased.



Which flower was Clytie turned into? The answer to last week's question.

In Greek mythology, Clytie is spurned by her former lover, Helios, the sun god. According to Ovid, in despair, she stripped naked, sat on a rock, and went on hunger strike, staring at the sun, in the hope that Helios would return to her, but he never looked back at her. After nine days she was transformed into a purple flower, the heliotrope (meaning "sun-turning"), also known as turnsole (which is known for growing on sunny, rocky hillsides). However, the sunflower, which is native to the Americas and would not have been seen in ancient Greece, became the flower of choice in depictions of the tragic nymph. This is not surprising given its visual similarity to the sun and like the purple heliotrope, the sunflower (*Helianthus -anthos* is flower in Greek) follows the sun for maximum photosynthesis, a process known as heliotropism.



Dutch expressionist painter, Vincent van Gogh, was arguably obsessed by sunflowers. He produced multiple pictures in the late 19th century.

Fun Sunflower Facts:

Not just a single flower - It is perhaps not surprising that the Asteraceae family to which the sunflower belongs used to be called the Compositae because the 'flowers' are a composite of many flowers, often of different types.

The "petals" or "sunrays" in a sunflower head are actually individual strap-shaped flowers called **ray flowers**, and the "sun disk" is made of smaller circular shaped individual flowers called **disc flowers**. The word "aster" means "star" in Greek, referring to the appearance of some family members, as a "star" surrounded by "rays". The cluster of flowers that may appear to be a single flower, is called a *head*. Each head generally has 13 to 30 ray flowers that are 2.5 to 5cm long, and 150 to more than a thousand-disc flowers!



Go figure - Many things in the plant world are organized in a manner that follows the Fibonacci series (eg. pine cone scales, individual sections of pineapples, garden rose petals). This series of numbers follows the pattern 1, 2, 3, 5, 8, 13, 21, 34, 55..., where each successive number is the sum of the previous two. The spiral pattern of the disc flowers of the sunflower is an excellent example. The disc flowers are arranged in two groups of spirals, one to the left and one to the right. If you count the number of left hand spirals, and then the number of right hand spirals, the two numbers will be neighbours in the series (typically 21 / 34, 34 / 55, or 55 / 89).



So why not take the kids down to the paddock and do some counting? Nature and maths combined in an outdoor classroom – perfect.

(A web search for ‘Fibonacci series in nature’ will provide links to more information.)

The Symbolic Sunflower - The sunflower has many meanings across the world. Different cultures believe it means **anything from positivity and strength to admiration and loyalty**. In Chinese culture, sunflowers are said to mean good luck and lasting happiness which is why they are often given at graduations and at the start of a new business.

Stupendous Sunflower - According to the Guinness Book of Records, the tallest sunflower measures 9.17 m (30 ft 1 in) and was grown by Hans-Peter Schiffer (Germany) in Karst, Nordrhein Westfalen, Germany, as verified on 28 August 2014. As for the biggest head, a sunflower with a head diameter of 82 cm (32.25 in) was grown by Emily Martin in British Columbia, Canada in September 1983. It is thought that larger sunflowers evolved in drier climates because there are typically less pollinators. However neither of the two record breakers emerged from an especially dry climate.

