

Are sustainable dyes really the future of fashion ?

The fashion industry consumes a significant amount of water, energy and chemicals in the dyeing process. These chemicals are released into waste water from dye houses and textile factories, therefore polluting the water supply with non-biodegradable dyes. This has a detrimental effect on the environment causing toxic chemicals to get into the drinking water systems, the sea and the food chain. This also prevents photosynthesis in water based plants as the light cannot pass through the water.

Sustainable fabric dyeing is when you create a dye which has no negative impact on the environment. Dyes are created using natural resources/ materials that are naturally occurring.



“Change is needed now to pave the way for the future. We can’t reverse the impact but we can look to mitigate it for future generations.”

Textile dyeing is the second largest polluter of clean water globally, as the global population is increasing so is the demand for clothes and other textile items. In recent years there has been high demand for fast fashion, high street retailers have changed and are still changing in order to meet the people’s demand for affordable and fashionable clothes that meet the current trends.

However, this type of fashion is not sustainable. Buying clothes that are on trend and low cost, are often only worn for a short period of time or are never worn again. This leads to a cycle of clothes being thrown away and replaced with new more current clothes.

We cannot carry on with this irresponsible attitude towards clothes and the environment. People globally all need to buy and wear clothes, we all need to take responsibility for the choices we make.

The fashion industry has a huge responsibility too, we all need more clarity on how our clothes are made, whether they are made sustainably and what goes into making each individual garment. Information like this will be eye opening to everyone, this will help customers to make more environmentally friendly choices and be aware of the effects that making clothes has on our planet. If we all did this collectively we could make a huge difference in changing the fashion industry for the better forever.

This photo was taken in 2014 in china, it shows waste from a dye house that has contaminated the soil and water, subsequently turning it red.



Sustainability is meeting the needs of the current generation without compromising the ability of future generations to meet their needs.

I have researched and experimented with sustainable dyeing and created my own samples using the method of solar dyeing.

Solar dyeing was not the most popular way of creating natural dyes but seemed the most sustainable. Solar dyeing is the method of creating a dye and dyeing the fabric using the sun as your heat source. This method is very effective although it has to be left in the sun from a few days to a week, so may take longer than other methods. Also because this method uses the sun as its heat source it will not work all year round as the seasons change.

I put my natural material into a 1 litre mason jar with either cold or hot water to see if the temperature of the water would effect the results of the dye.



The natural materials that I used to create my dyes are ...

- Avocado pits and skins
- Red cabbage
- Turmeric
- Spinach
- Beetroot



The naturally occurring pigment in some vegetables or roots are called Anthocyanins. Anthocyanins are water-soluble vacuolar pigments, the colour is dependent on the pH value. The main colours of Anthocyanins are red, blue, purple and black. Another common pigment is Betalain. Betalains are a group of red and yellow pigments that are commonly found in beets but also can be found in flowers, fruits and plants. These naturally occurring pigments are water soluble and when you put the natural material in the water the pigment is released creating the natural dye.

To create my dyes I left the water containing my natural materials in the sun for about a week, so that they developed a strong colour. After that, I filtered my dyes through a piece of calico in a funnel into a milk bottle, so it was pure and could be stored to use later.

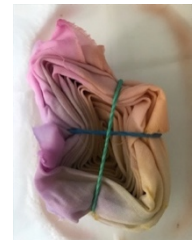


I then put a piece of white cotton into a empty mason jar and poured just enough dye onto the fabric so that it would cover it. I then left it for a few days to soak in the dye.

After a few days, I removed the fabric from the mason jar and placed it on a tray to dry out in the sun. Then I rinsed it to remove any excess dye from the fabric and I left it to dry out again. I found out from my results that depending on when you rinse your fabric you can get different shades of colour. So I decided to experiment further, by repeating the same process with all of my dyes.



I also wanted to test to see how effective the dyes were when they are used to tie-dye one piece of fabric creating a patterned effect. The dyes overlapped and blended to create different colours and shades.



Another commonly used method to create a dye is boiling on the hob. This is where you chop up your natural material into small pieces and add it to a pan with twice as much water. The pan is brought to the boil and then simmered for about an hour, until you get an intense colour or your desired depth of colour. After that you carefully strain out the natural material so you are left with a pure dye. Then you are ready to start the dyeing process.

I used 100% cotton fabric to dye with, as cotton is a naturally occurring material. From my research natural cotton was the most commonly recommended and used fabric to be dyed with natural dyes.

I think that natural dyeing is very effective and I am very happy with the results. I am creating a dye on a much smaller scale than a fashion brand would do so. In order for this to be commercially viable adaptations and efficiencies need to be made to the process.

After creating my own natural dyes I was intrigued to find out what developments there had been in the fashion industry.

There has been a huge advancement in the fashion industry with more and more techniques and technologies being discovered for sustainable dyeing.

Several global fashion brands have made sustainability pledges to show what they are doing now and plan to do, to become a more sustainable fashion brand.

One brand paving the way in new dyeing technologies is Adidas, which aims to achieve climate neutrality by 2050.



Adidas uses DryDye technology to dye some of their pieces. DryDye uses no water, 50% fewer chemicals, 50% less energy than the traditional fabric dyeing process. They use the technique of DryDye which is where they inject dye into the fabric using compressed carbon dioxide. Once they have finished the dyeing process the carbon dioxide is converted into a gas in order to condense the dye and separate it from the gas. So the carbon dioxide can be recycled and pumped into the dyeing container.

Adidas first introduced this technology in 2012 and since then they have continued to integrate it into many of their products. This method of dyeing is more sustainable than the traditional method of dyeing. However, this method is not fully sustainable as the use of chemicals will still have detrimental effects on the environment.

One of the leading and innovative companies of the textile industry is Dyecoo.



Dyecoo is a dye company that uses CO₂ technology in order to dye their fabric. This is the world's first 100% water-free and chemical-free textile processing solution, which can be used on an industrial scale. Their aim is to lead the textile industry into a clean future.

Dyecoo's dyeing method is sustainable and environmentally friendly. This technology could help all fashion and textiles companies to become sustainable.



Dyecoo has collaborations with major brands such as Nike, Ikea, and Adidas who are already using Dyecoo technology in the manufacturing of their products.

These companies are role models and hopefully will drive change in the fashion and textile industry, as they show that it is viable to manufacture clothing sustainably on a large scale.



There is the knowledge and technology to dye fabric in a sustainable way, the challenge for the fashion industry is manufacturing affordable and sustainable clothes on a large scale. Together with educating consumers about how their clothes are made and the impact they have on the environment. Brands need to take a step towards becoming more sustainable companies to help mitigate the effects that the fashion industry has on our planet. We have already caused an enormous amount of damage.