MANIFESTO

Why we do the things we do

ECOLOGICAL

TEXTILES

This manifesto was written in 2025 on the occasion of
Ecological Textiles' 20th anniversary.

Why we choose natural textiles

"Why did you switch to organic farming?"

It is in the late morning on a warm October day and we are standing on a cotton field in western Türkiye. Together with the owner of a ginning factory, where seeds and plant residues are removed from the white cotton bolls, we drove along small and bumpy sandy roads to Mehmet Arikboga's field. In the background rise the rocky, sparsely vegetated hills around Izmir, the former Smyrna. On the other side, not far from where we are, is the Aegean Sea. Mehmet walks along the rows of knee-high cotton bushes, among which, incidentally, the weeds are rampant. Sixty years old, he is and has been a farmer all his working life. Yet he switched to organic cultivation only a few years ago, not only of cotton but also of food crops. "Why?"

He points to the clear blue sky above us. "Because the birds are gone. When I was young, there were a huge number of birds. But at some point I noticed that there were fewer and fewer of them. It dawned on me that it had to do with the way we cultivate, the use of pesticides. Birds can be a pest to farmers, but I saw that we were destroying nature and the land we depend on as farmers. I love my profession and the land and felt it couldn't go on like this."

Cotton is already being harvested in many places this morning. On the way to Mehmet's field, we see cotton pickers at work in several places and come across trucks loaded with cotton. The exuberantly flowering oleanders on the roadsides are sometimes covered in a white cloud of cotton fluff. At Mehmet's place, however, the cotton is not yet ready to be harvested. The buds of some plants are already open and white cotton balls pop out, while others are still closed. "One more week," he estimates, "then we will also start harvesting here."

Mehmet saw the land and nature he depended on changing and decided he needed to change course. Similar ideas led us to found Ecological Textiles in 2005. Already in the 1990s, the textile industry was under a magnifying glass. The internet was still in its infancy and social media did not yet exist, but alarming stories appeared in the press: about the greatly increased use of pesticides and herbicides on cotton fields, about farmers and farm workers who sprayed agricultural poisons without protection and without much knowledge and then stored what was left at home in unsafe conditions. About the serious diseases that could be traced to the work in the fields, about the deteriorating soil quality, the uncontrolled waste of water and the dramatic consequences this rapacious farming had on the land and biodiversity.

Despite all indications that the textile industry, partly due to its huge scale, was devastating the planet and humans, the availability of organic textiles was still very limited. Organic farming was mainly about food crops. But there were pioneers active even then, ideals-driven entrepreneurs who stuck their necks out as early as the 1970s and 1980s and whom we got to know. People like Jürgen Erlenburg of the German company Lichtschatz, who organised farmers in Türkiye and offered them a guaranteed outlet for organically grown cotton, or Chieko Watanabe who set up projects for growing organic cotton in Cambodia and organised the Japanese Organic Cotton Association in her own country. Slowly the notion grew among us, in the textile industry and among consumers that something had to change. This was reflected, among other things, in companies starting to focus entirely on textiles of natural and organic origin. It also found expression in textile standards. In 1999, the International Association for Natural Textiles (IVN) was founded in Germany, followed three years later by the US Organic Exchange, later renamed Textile Exchange. In 2006, a year after we started Ecological Textiles, the Global Organic Textile Standard (GOTS) came into being.

Twenty years on, many of the 'old' problems plaguing the textile industry are far from being solved. And the problems are sometimes very old. In 1845, 25-year-old Friedrich Engels, son of a German textile manufacturer who had settled in England, walked the streets of Manchester and other textile centres and wrote down the misery he encountered. Engels was not the first to draw attention to the

conditions in which textile workers lived and worked, and many similar denunciations would follow. Historian Sven Beckert, in his book Empire of cotton (2015), drew a direct line between the 'war capitalism' that characterised the cotton industry and slavery on American cotton plantations. Increasingly, producers in countries where the working class was more or less protected by liberal laws moved their production to regions where this was not yet the case and where production could therefore be cheaper. To the east! At the end of the nineteenth century, Dutch textile companies were already starting an exodus, moving among others to the Lausitz on the German-Polish border, later to the Czech Republic and then even later to Asia. In many cases, misery, exploitation and oppression moved with them.

One of the most dramatic events related to modern slavery in the textile industry is the collapse of the Rana Plaza building in Bangladesh in 2013, which left 1134 dead. Underpaid workers were producing clothes for several Western brands there, in appalling and unsafe conditions. All forms of exploitation seemed allowed as long as the price of clothes for Western consumers was kept as low as possible. Various journalistic reports and investigations revealed that not only corrupt local entrepreneurs were to blame for the situation in the garment industry but, more importantly, Western brands. The global outrage that followed this disaster in the textile industry was intense but also short-lived and seems to have subsided by now, just as earlier uneasy feelings about sweatshops in Asia and Central America disappeared. European legislation that made it impossible for large companies to look away from exploitation was repealed at the eleventh hour. No doubt this was done under pressure and threats from multinationals but many consumers also seem to be fine with it.

Of course, everyone is a warm supporter of fair-made clothing. Except when it comes with a price tag. When the Rana Plaza building collapsed in 2013, clothes were made there for big western fast fashion brands. That it hardly seems to affect many consumers is evident from the heady growth of "ultra fast fashion", the superlative of fast fashion by brands like Shein and Temu, which only started after the Rana Plaza disaster. Temu was only founded in 2022, Shein had no more than 100 employees in 2016. Today, there are more than 16,000.

More problems have developed in the past 20 years. Greenpeace drew attention to highly polluting dyes and toxic auxiliaries used in the textile industry with its Detox my fashion campaign. In addition, around 2015, the issue of microplastics began to attract attention, microscopic plastic particles found in drinking water and air, which we inhale, eat and drink and that accumulate in the body. According to a recent study, the amount of plastic in human brains is thought to be about the same as a plastic spoon. To a large extent, the increase of these microplastics in the environment was found to be due to the explosive growth of synthetic fibres used in the textile industry. Then there are also the growing concerns about the use of PFAS, the "forever plastics" in textile finishing and the problems caused by overproduction by the (ultra) fast fashion industry in particular, which is causing problems in all kinds of countries, the most pregnant example being the mountain of discarded textiles in Chile's Atacama Desert that is so big it can be observed by satellites.

Can this continue? We think not. Ultimately, the conventional textile industry has run into a dead end. Not only because the main source for synthetic fibres, petroleum, will become increasingly expensive and will one day run out but also because a solid future cannot be built on a foundation of pillaging the planet, plundering nature and exploiting people. Reason for Ecological Textiles to stick to textiles made from natural materials, if possible from controlled organic farming.

Organic cotton

“Given the agricultural toxins and huge amounts of water that cotton requires, one may wonder how sustainable cotton is. Even organic cotton is a problem because organic cultivation takes more farmland that could also be used for food crops.” Thus, a recent discussion on LinkedIn reiterated the objections to cotton. And apparently, there are also objections to organic cotton.

Of course, in 2005, we very consciously chose organic cotton as a more sustainable and cleaner alternative to conventionally grown cotton. In conventional cotton

cultivation, synthetic pesticides (fungicides, herbicides, insecticides) as well as artificial fertilisers were and are sometimes intensively used. Conventional cotton is almost always also genetically modified cotton. That the widespread use of “plant protection products” results in major environmental damage and is one of the causes of biodiversity decline is undeniable. The decline of bees, other insects and insect-feeding species is directly related to the use of pesticides. Even humans are not safe from pesticides. Increasingly, links are being made between neurological disorders like Parkinson’s or ALS and the use of pesticides, which are applied in the cultivation of food crops but also in commercial crops like cotton and flowers. Even if the authorised amounts of pesticides remain within the standards allowed for this purpose (which does not always happen), the question is whether these standards are too low.

Remarkably, many farmers continue to put their own health at risk in the process. A recent example of this in cotton farming is playing out in Australia, where neurologists are warning about the health hazards of Paraquat, a popular and readily available herbicide used in conventional cotton farming. However, the organisation of Australian cotton growers Cotton Australia opposes a total ban on these pesticides because it would otherwise make weed control too difficult or, as Cotton Australia’s president put it, ‘There would be less cotton.’

Mehmet Arikboga, the Turkish farmer we spoke to on his cotton fields near Izmir, clearly had a different point of view.

Organic farming is less productive and effective which for some is an argument in favour of conventional methods, pointing to the growing world population and ultimately limited arable land. This may be true but on the other hand, around 40 per cent of arable land worldwide is dedicated to growing animal fodder. As long as biodiversity continues to decline, as long as fields remain contaminated with agricultural toxins, and as long as ground and surface water remain of dubious quality as a result, these kinds of concerns do not carry much weight for us. Moreover,

certified organic farming always has an important social component, meaning it is not only about the cultivation itself but also about labour rights, remuneration, etc.

The organic cotton fabrics in Ecological Textiles' collection all come from Türkiye, more specifically the Aegean region. The cotton grown in Türkiye is almost always Gossypium hirsutum (the so-called upland cotton) the most common species worldwide and suitable for most applications.

Why Türkiye? A key reason is the availability of organic cotton. In Europe, cotton is grown in Greece, southern Spain and, to a lesser extent, Italy, but with the exception of a relatively small project, it is not organic cotton. For organic cotton, Türkiye is the closest production country. Its proximity makes transport by truck possible. Moreover, there is still a large textile industry in Türkiye, which also limits the distance between fields and factories. This means that a significant part of the cotton is processed in the same region where it is grown.

What also counts is the good reputation of Aegean organic cotton, not only regarding the fibre (colour, fibre length, spinnability) but also of the yarn and fabrics. In other respects too, Turkish cotton's reputation is better than that of other major producing countries. In China, eighty per cent of cotton is grown in the Xinjiang Autonomous Region, an area where serious human rights violations take place. From India, there are regular reports of corruption and tampering with organic certifications, as well as contamination of organic cotton with genetically modified cotton. Most of the world's (conventional) cotton production involves GM cotton but GMO is banned by law in Türkiye, thus following the EU's Biosafety Law.

Should cotton, and even organic cotton, now be called a problematic crop, as suggested in the LinkedIn post above? Sometimes yes and sometimes no, seems to be the only right answer. Some problems in conventional cotton farming that were very much in evidence in the 1990s and 2000s, and that led us to go for organic, have since improved. The use of agricultural poisons peaked in the mid-1990s, since then there has been a downward trend attributed to greater awareness of the problem, new regulations and better training programmes for farmers.

Stories about excessive water use attributed to cotton cultivation have also since been revised. Cotton organisations like Cotton Inc. have long pointed out that cotton is a drought-loving plant with a water footprint lower than that of many other major crops like rice, soybeans, maize, and wheat. A recent study by the International Cotton Advisory Committee (2025), covering several years and covering several hundred growing sites in several countries, concluded that on average, cotton does not use more water than other field crops. Other researchers have already managed to firmly nuance the relationship between disasters such as the desiccation of the Aral Sea and cotton cultivation in the region.

However, these improvements have failed to allay concerns about conventionally grown cotton. Cotton is a fibre with great properties and offers fantastic comfort. In addition, it is biodegradable and breathable. We can hardly imagine a world without cotton. But the properties and advantages of cotton should not be pushed into the background by problems in cultivation or processing. That is why at Ecological Textiles we only choose GOTS-certified cotton fabrics.

European hemp and linen

A funny story in the newspaper: a hobby grower had sown a tiny field of hemp near a nature park. It was industrial or fibre hemp, but when local authorities discovered the plants, action had to be taken. Immediately! Despite the grower's assurances that no drugs could be made from it, the hemp had to go. Pulling out the deep-rooting plants was too much work so a farmer was hired who came at it with a large corn mower. After only a few metres, the machine jammed. Hemp, after all, is not corn.

That was about twenty years ago. Hemp oil or cbd products were sold here and there, but other than that, hemp was really only in the news when some illegal farm was dismantled.

The situation has changed somewhat since then. Hemp is in the spotlight because it is a plant with unprecedented potential. Also for textiles. In early 2025, the Bioeconomy Knowledge Centre, an initiative of the European Commission, published the report Bio-based textiles in a sustainable and circular bioeconomy. That study highlighted the importance of "European textiles", made of natural fibres that fit into European eco-systems. Since the cultivation of cotton is necessarily limited

to only a few areas due to climatic conditions, the report focused on other fibres: flax (linen), hemp and wool. After all, flax and hemp grow fine in several European regions, and we have plenty of wool as well.

Yet it is a curious development. In the 1930s, hemp was banned in most of the western world, including most European countries, due to its association with drug use. Lobbying by the paper industry and the then booming petrochemical industry, which makes synthetic fibres, is also said to have contributed to the creation of this ban. And now farmers are urged to grow hemp and subsidies are provided to promote hemp cultivation. The confusion surrounding hemp could arise because some varieties of Cannabis sativa produce larger amounts of the substance THC (tetrahydrocannabinol), the substance that affects consciousness and gets users high. Cannabis sativa also has varieties that produce very little THC but are virtually indistinguishable botanically from those that do. The low-THC-producing group, called industrial or fibre hemp, is what we are talking about here.

The story of the misunderstood plant that, partly due to an evil but effective lobby, was banned and then tries to make a comeback, appeals to many people. But that, of course, is not all. Hemp is being embraced by a growing group of eco-conscious consumers, who are not only pointing to the environmental benefits offered by hemp cultivation (low water consumption, little to no use of pesticides, high CO2 storage capacity, possibility of "local" cultivation) but also to its comfort.

However, while enthusiasm about hemp is high, so are the obstacles that need to be overcome to make hemp truly part of the sustainable and circular bioeconomy envisioned by the EU.
Despite the widespread narrative that hemp is a relatively easy crop to grow, that is where the challenges begin, Natasja Doelman of the Dutch company Delphy, which specialises in plant cultivation, told us. Delphy is involved in an EU-funded European hemp cultivation project.

"Due to various causes, the plants do not always reach full maturity. A regular cause is excessive soil compaction which reduces oxygen in the soil. Cultivation can also suffer from too much rain and snails are also sometimes a problem."
As one of the main causes, Doelman points to climate change. "A seed is only about two centimetres underground after it is sown. So it is vulnerable to all kinds of external influences."Another challenge for cultivation in north-western Europe is that hemp can only be harvested late in the summer. Afterwards, the cut stalks remain on the field for some time to 'ret', a process in which they are partially broken down by natural processes, by fungi and micro-organisms. Both the weather (rain, sun) and the soil affect this process, which also determines the colour of the fibre. Because the process depends on the weather, retting is difficult to control. Rain is needed to start the process, but the crop must be dry to make it stop. So the hemp must be sufficiently retted and also dry before it can undergo the next set of operations. Especially in late summer and early autumn, it often rains in northern Europe, which can lead to problems such as "overretting"."One of our goals is therefore also to look for hemp varieties that can be sown earlier and harvested earlier, to stay a little further away from the wet season," says Doelman.
However, developing a variety that can be harvested earlier is a long-term business. During a visit to the Van de Bilt seed breeding company specialising in flax and hemp in Sluiskil, director Lenno Vermaas explained that up to ten years can pass before a new variety is fully developed.'After those ten years, using that new variety as a starting point, work can resume on the next generation,' he said. The backlog of hemp cultivation and processing compared to flax, for example, is huge."

Like hemp, linen is a so-called bast fibre that undergoes a similar processing process. They are also similar in other respects (tensile strength, wearing comfort, etc.). Unlike hemp, however, flax has never been banned from the fields and plant breeding has continued uninhibitedly. This translates into the fineness of linen yarn, which can be spun at a much higher yarn count.

China, where hemp textiles have never gone away, has an advantage over Europe here, allowing a finer yarn to be produced with the varieties grown in China. Further refinement of the fibre is also sometimes done in China using methods that are not (allowed to be) used in Europe, e.g. chemically or with enzymes.

According to data from the European Industrial Hemp Association (EIHA), hemp acreage in Europe has grown from 20,540 hectares in 2015 to 33,020 hectares in 2022. France is the leading European producer.France is also the European leader in flax cultivation. Figures from the Alliance for European Flax-Linen & Hemp indicate that 75% of the global production of long-fibre flax used in the textile industry comes from France, Belgium and the Netherlands, particularly the coastal areas between Normandy (France) and South Holland. By far the majority of this (87%) is grown in France. The reason is that in this region, the soil and mild climate are ideal for cultivation. However, despite the fact that the area under flax is also increasing, there are also problems here due to climate change.

For textile production, long hemp and flax fibres are preferred. Short hemp fibres can also be made into textiles after a process called cottonisation. This is done in a special spinning process and always in a mixture with another fibre, usually cotton but sometimes wool and even synthetic fibres. Interest in cottonised hemp is also growing. A bigger stumbling block remains processing capacity. The processing industry has almost disappeared from Europe. Spinning mills specialising in processing long-fibre hemp or linen are few and far between. So do these take maximum advantage of their unique position? Not always. For instance, a renowned spinning mill in Hungary had to close its doors a few years ago because some of its staff migrated to western Europe, where wages are higher.

In France in particular, several initiatives have been taken to move towards local textile production where it is possible to connect to existing production lines for processing linen. In other countries, especially parts of the former Eastern Bloc (Hungary, Romania, Moldova, Ukraine, Belarus), the processing industry has never completely gone away but we have the impression that here work is still often done with outdated machinery.

Is there a future for hemp and flax? Again, the question is what drives consumers. If they go for cheap fast fashion, then there is still a long way to go when it comes to revitalising the European flax and hemp industry. In the short term, things do not look good. The share of synthetic fibres in world textile fibre production has been steadily increasing for years, and is currently close to 70 per cent. This means that natural fibres now account for only 30 per cent of total fibre production, and that is mainly cotton. The share of hemp, linen and all other vegetable fibres (jute, rami etc) together is less than six per cent.

Using indigenous wool

About 15 years ago, we were philosophising about native wool. Why did so little happen to the wool from the sheep we saw every day on the moors and meadows nearby? Wasn't that wool suitable for textiles? Of course, we did know that the wool of our native sheep was a bit thicker and coarser than that of Australian merinos and was therefore a bit itchier. But then, aren't there other uses for native wool? Does sock wool always come from merino sheep? And what about the famous tweed from Scotland and Ireland. Wasn't its quality comparable to the wool from the sheep we saw roaming around our area? The town where we live was already known for its 'drapery' in the 13th century, a place where woollen cloth was produced and traded. A fulling mill stood there at least as early as 1294 and possibly even earlier. We read that wool was imported from England centuries ago but also that a lot of native wool was used then. Why was this indigenous wool usable then and why do we now import it from other continents?

We decided to buy wool from Dutch sheep farmers and then have it washed, spun and woven. The first production was of wool from sheep kept near the old cloth town of Leiden, in the so-called Green Heart of Holland. A few years later, we learnt about a farm in our own region, which kept an old breed of sheep typical of the area, the Campine Heathsheep. The sheep was named after the region where it is common, the Campine (De Kempen), an area encompassing parts of Belgium and the Netherlands.

On a beautiful Sunday in June, a shepherd with his dog (of course it is a border colly) drives a flock of about a hundred sheep from the woods and moors towards the Beatrix farm near Roermond. The shepherd whistles and points, the dog runs but meanwhile doesn't lose sight of the sheep for one moment.

On this summer day, the sheep, all Campine heath sheep, are herded together to be sheared. In the process, each sheep is stripped of several kilos of wool by expert shearers. The farm is home to 'Landschapsbeheer De Wassum', a company that has been grazing natural and agricultural areas by sheep since 1988. These are often nature areas where the original heather vegetation has had to give up more and more space and is being supplanted by grass due to excessive nitrogen deposition.

Why did we choose wool from these sheep? Mainly because we were looking for a local natural fibre that could be processed (relatively) nearby. In the Netherlands, where no cotton grows, you quickly end up with linen, hemp or wool.

But also because the Kempen moorland sheep is a bit of a local sheep. We imagined that the sheep kept in our region in the Middle Ages also looked a bit like this breed. After all, typical wool or meat sheep, which were kept specifically for their wool or meat, did not exist back then; the breeds of those days were kind of all-rounders. A bit like the moor sheep, we thought.

We were not too concerned about the thickness and "micronage" of the wool. Since the late Middle Ages, there has been an obsession with the fineness of wool that eventually led to the success of merino wool but also, unfortunately (partly due to clever marketing by the merino industry), to the undervaluation of other wools. As a result, several sheep breeds are now threatened with extinction.

Sheep farmer Van Beek is trying to further improve the quality (fineness) of his Campine wool through a targeted selection and breeding policy and by constantly examining the micronage of his sheep's wool. But of course, it is clear that Campine wool will never be as fine as merino wool. On the other hand... how bad is that? Numerous products can still be made from the slightly coarser wool, including for clothing. These include coats, jackets, jumpers, cardigans, hats, slippers, etc.

How local is local? The sheep themselves are in the Netherlands, but it is impossible to process the wool here. The reason is simple: the companies that do this (laundries, spinning mills, weaving mills) are simply no longer here. So for washing the

wool we had to rely on a company in Belgium, spinning and weaving were done in Germany. As a result, the maximum distance between where the sheep are and where the processing takes place is about 700 kilometres.

The spinning mills and weaving mills we work with also import wool (especially merino wool) from other parts of the world, notably Australia, New Zealand, Australia and Argentina. Sometimes this is organic wool, sourced from organic livestock. Certified organic wool offers the guarantee that more than average attention has been paid to animal welfare. In addition, the animals are for instance not fed GMO-modified food, are not preventively treated with chemicals against diseases or disease-causing insects, etc. The practice, still common in parts of Australia, of "mulesing" the preventive removal of skin around the tail to better protect the sheep from parasitic fly attacks, is forbidden.

Yet not all the wool in our collection is of organic origin. Organic wool constitutes only a fraction of total wool production. For many sheep farmers, organic certification is irrelevant or too expensive. Even our own productions with local wool are not organically certified, despite the fact that the sheep mainly live in nature reserves. If organic wool can be supplied, the costs of certification are passed on to the spinning mills and then the weaving or knitting mills and finishers. For relatively small quantities of organic wool, those companies sometimes have to take drastic measures because the organic wool is not allowed to come into contact with conventional wool. This leads, for example, to separate storage, more maintenance of machinery and keeping separate records. These costs are in turn passed on to consumers.

In recent years, several spinning mills or weaving mills we work with have therefore scaled down their organic productions, sometimes pointing out that many sheep live in quasi-natural conditions anyway and that (for them) the added value of organic wool is too low. Many farms do opt for a watered-down form of organic, for example a declaration that the wool does not come from mulesed animals.

Quest for blue

It was a sunny summer morning in 2016 and we were standing in the courtyard of what was once a tannery, in the south of France. It was immediately clear, this place was all about colour and one colour in particular: blue. The shutters in front of the windows were painted light blue, as were the wooden flower boxes and the large entrance gate. Even the old Jaguar parked next to the blue gate was this colour. Hesitantly, we walked on until someone shouted something to us from an open upstairs window, in English with an unmistakable American accent. Hanging out of the window was the woman we had agreed to meet. Blue shirt, blue trousers and, we saw later, blue hands. It was Denise Lambert.

How had we ended up with Denise here in southern France, a few kilometres from Lectoure (Gers), a small town of less than four thousand inhabitants? That story began with a project we had taken up together with Daniera ter Haar and Christoph Brach of Eindhoven-based design studio Raw Color: to make a series of plant-dyed fabrics on an industrial scale using only the classic indigenous dye plants madder (for the reds), woad (yellows) and indigo (for the blues). As we all had a strong preference for local dye plants, we preferred to use woad, the indigo plant native to Europe, for the blue. To the series of fabrics thus produced, we gave the name Tinctorial Textiles.

Plant-based dyeing of the fine woollens went fine... except for the blue. Dyeing with woad on a reasonably large scale proved trickier than thought. Where do you get woad indigo, for example? The dyers and finishers we worked with were able to dye with natural, vegetable indigo but woad indigo? They didn't have that. Was woad actually still grown anywhere? And how was indigo extracted from it? As far as we knew then, only in the south of France, in the direction of Toulouse, would people still work with woad. Perhaps there were still opportunities there?

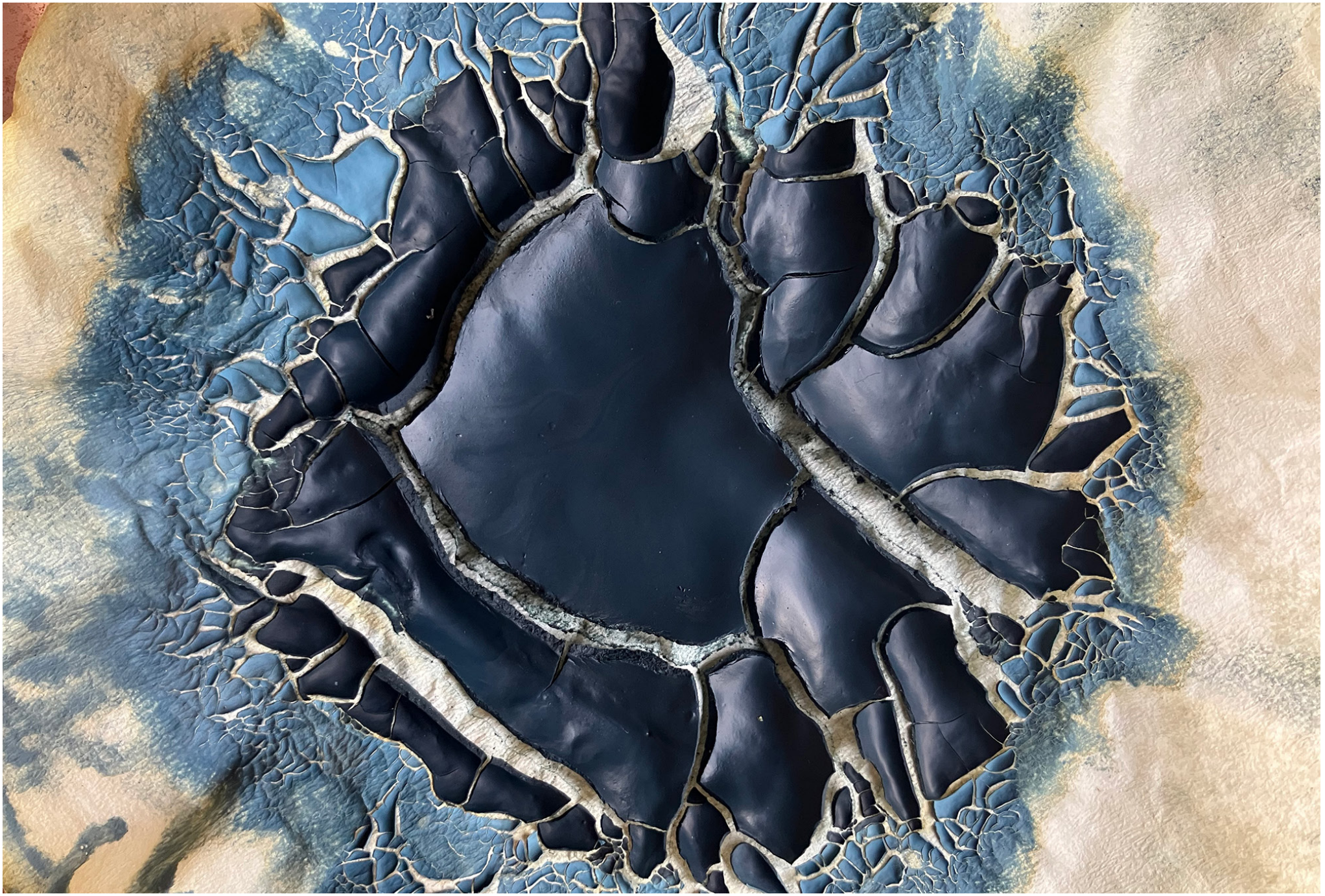
That's how we came to Denise. Seated at a large wooden table, she told us her story. How she and her husband Henri Lambert found window shutters from the 15th century that were still blue despite their age, and that this sparked their fascination with woad, a plant that was once of great importance but is now virtually unknown. She told us about the wealth accumulated by woad merchants in Toulouse, about the prosperity that woad cultivation brought to the region at the time, about the competition that woad faced from cheaper and more effective tropical indigo from the sixteenth century onwards, and how vegetable dyeing was eventually pushed to the margins of textile processing after the invention of synthetic indigo.

While Denise worked for us on a project for a London restaurant, as soon as we got home we began our own quest, first and foremost in literature. To our surprise, it turned out that the region where we live and work was, like the area near Toulouse, one of the European "hotspots" of woad cultivation centuries ago. An area where cultivation was promoted by regional princes, where farmers grew the plants and processed them in woadmills and where specialised traders and blue dyers were active. We looked for possible remnants of it (there are hardly any in our area, by the way), wrote articles in local history publications and crisscrossed Europe to learn as much as possible about woad from growers, writers and dyers.

And we met Dave Duijf, a farmer who mainly grew cabbage but was also curious about woad, not least because, like many types of cabbage, woad belongs to the cruciferous plant family. In 2018, Dave sowed woad on a piece of land next to his farm.

Initially, we worked more or less according to old recipes that we supplemented with info we got from experts on plant dyes and what could be found here and there on the internet. Even though Dave grew on relatively poor sandy soil and woad used to be grown mainly on very fertile land, the plants came up well and it turned out to be quite easy to dye blue with woad on a small scale. This all corresponded nicely with all kinds of videos on the internet.

But we also found out that scaling up to larger quantities (from laboratory scale to real production) required a very different approach. Making a dry and powdered extract requires not only a lot of knowledge and routine but also a lot of plants. To



give an impression of this, you first need to know that the blue dye is produced in the leaves of the woad and that only the leaves are harvested for this reason. This is done by clipping or cutting them off. Since new leaves are then formed fairly quickly, several harvests are possible. How many depends on the climate, the amount of sunshine, how much it rains, etc. In a Mediterranean climate, sometimes four to five harvests are possible in one season, in north-western Europe it is usually two or three.

Dyeing with woad has a long and fascinating history, but woad is also notoriously ineffective. One plant produces 100 to 300 grams of leaves in a season, and about 100 to 120 grams of dye can be made from a hundred kilos of leaves. That means you need quite a lot of plants, soil (space), water and other resources for somewhat larger productions. This was exactly why dyers all over Europe in the sixteenth and seventeenth centuries switched to the much more effective tropical indigo as soon as it became available at a reasonable price.

We therefore welcome the support of Dave, who has everything needed on his farm: large 1,000-litre ibc containers, a pump to use groundwater, a forklift, plenty of space... Despite those facilities, the results remained mixed and it remains difficult to process larger quantities. If everything worked perfectly, the result after processing a hundred kilos of leaves was 100-120 grams of indigo powder. If it didn't work, there was nothing else to do but to find out where it had gone wrong, process another hundred kilos of leaves (sometimes this could only be done in the next season) and, above all, try to keep the good humour.

Meanwhile, we wonder whether the modern, slightly larger-scale way of processing woad is the most efficient. Some researchers point to the good results achieved from the late Middle Ages to the 18th century using methods quite far removed from modern "mechanical" farming methods. Those modern methods have proved suitable for other indigo plants, but are they as effective when it comes to woad? It is also pointed out that especially in wool dyeing, woad was used by dyers well into the 19th century to make the indigo bath. We haven't figured it out yet but one thing is certain: dyeing with woad is rooted in European culture and has a centuries-old tradition here that is missing from other indigo plants. That adds to the story and appeal of woad. That is why we continue to search, cultivate and experiment.

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Ecological Textiles

Marie Curieweg 3C

6045 GH Roermond

Netherlands

www.ecologicaltextiles.com