

# Farmer designers, an art of living

14 July 2021 – 17 January 2022

Musée des Arts décoratifs et du Design

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One of the main roles of design today is to invent new reciprocities. While modernity has forged the idea that humans could control their environment and make nature their own, we now know that this is simply not the case. The current crises are our confirmation that it is time to change paradigm.

20<sup>th</sup>-century industrialization has profoundly transformed our soils in order to feed more people, more effectively: two concepts that are nowadays being called into question on all sides. Food has become an incredibly complex arena; from farm to fork, many different processes come into play.

In English, the word 'design' is used with precision: fashion design, interior design, sport design. This exhibition is devoted to farming design. A renewed agriculture committed to dealing with the upheavals in biodiversity and climate.

The exhibition makes soil our central focus, revealing new knowledge about its role, how it functions and the ecosystem that it harbors. It demonstrates the scales of crops and production, offers insights into new farming practices and reexamines the dimension of time. Here in France as well as on other continents, it explores the origins of a new culture that places people at the heart of unprecedented ties with nature and repositions them on an equal footing, as one of the links in the chain of life alongside living beings, plants and animals. A fresh perspective on the world to which we belong.

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Assisted by Étienne Tornier

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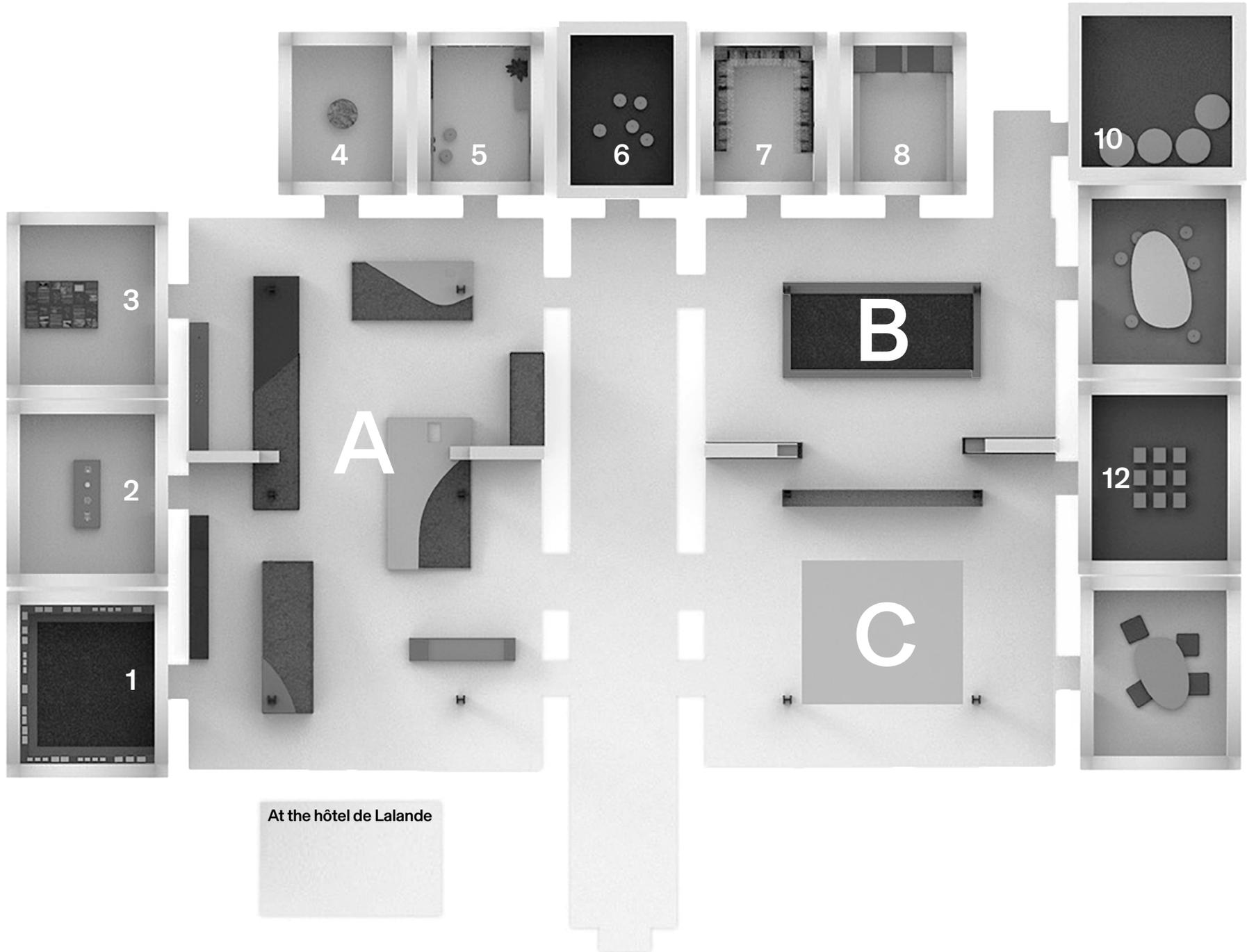
Émilie Rousselou

# Plan of the exhibition

- A A renewed agriculture
- B The farmer's tools  
Tools for an agroecological transition
- C *Real Facts*

- 1 Draw the landscape
- 2 When the farmer takes over
- 3 Regenerate the soils, design for a fertile land
- 4 Water, a virtuous cycle
- 5 The genius of plants
- 6 A day in real time with Félix Noblia
- 7 Seeds, a lively heritage
- 8 Leaven, the unsuspected matrix of bread
- 10 Three portraits of young farmers
- 12 Standardization of the living, what is the limit?

At the hôtel de Lalande  
*Misterien*  
Barbara Schroeder



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**1 Rachel Louise Carson (1907-1964)**

After the resounding success of *The Sea around us*, the American biologist embarked in an investigation denouncing the disastrous effects of the use of pesticides and other chemical products, recycled from war industry. In 1962, the publication of the *Silent Spring* triggered a war with agro-industrial lobbies who discredited her scientific status. She died from cancer in 1964. The use of DDT was finally forbidden in 1972 by the US National Environmental Protection Agency (EPA).

“For the first time in the history of the world, every human being is now subjected to contact with dangerous chemicals, from their conception until death”. (*Silent Spring*, 1962)

**2 Richard Buckminster Fuller (1895-1983)**

American architect, engineer and designer, faced with the great challenges humanity had to deal with, he advocated a design revolution in innovation by adopting the dual perspective of global vision and local action.

In his *Operating Manual for Spaceship Earth* (1969), Buckminster Fuller introduced a concept that made him famous: we share a common vessel that we must preserve.

“We all live on a single island surrounded by a large ocean. It is our only vessel to navigate through space: our spaceship Earth! It contains enough resources to take 100% care of humanity, but it needs to be flown with care!”

**3 Akira Miyawaki (1928-)**

Japanese botanist, a pioneer in applied ecology for forest restoration, he progressively composed a major bank with more than ten million seeds. Based on his researches, he developed a method known as “Miyawaki’s method” which allows the restoration of indigenous forests from native trees on poor soils, degraded or deforested. Doing so, he contributed to refurbish more than 1300 sites in Japan.

**4 Victor Papanek (1923-1998)**

Austro-American designer, teacher and activist, he conceives design along with a political scope and associate the designer job with the notion of social, ethical and moral responsibility.

The environmental impacts of design are at the heart of his preoccupations, leading him to lay the foundations of eco-design (or social design).

**5 Walter James, Lord Northbourne (1896-1982)**

Walter James is an atypical figure in the English agricultural landscape. Influenced by Rudolf Steiner, he meets in Switzerland Ehrenfried Pfeiffer, the main figure of biodynamic agriculture, and invites him over, in his farm in Kent, to give his first lecture in Great Britain.

He coins the concept of *organic farming*, described in his book, *Look to the Land* (1940), in which he asserts the logical link between human beings and every living beings and where he describes the farm as an organism, as a living whole, that detains a balanced organic life.

**6 Jagadish Chandra Bose (1858-1937)**

A pioneer in research on electromagnetic waves, semiconductors and radio waves, the Indian researcher dedicated himself after 1900 to plant electrophysiology and produced landmark works on plant growth, the reaction

of plants to various stimuli and to electromagnetic waves.

In 1926, he is invited to give a conference at the Sorbonne on “The nervous system of plants”.

**7 Chico Mendes (1944-1988)**

Brazilian syndicalist leader, known for his fight for *seringueiros’* rights (workers who collect latex in rubber tree plantations in Amazonia), Chico Mendes encouraged the creation of forest reserves managed by traditional communities. His murder in 1988, at the behest of a landowner, prompted the Brazilian government to cut

off credit for grazing in the Amazon and to create a nature reserve of nearly one million hectares bearing his name.

“At first, I thought I was fighting to save rubber trees; then I thought I was fighting for saving the Amazon rainforest. But now, I know I am fighting for humanity.”

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**8 Henri Mendras (1927-2003)**

French sociologist, Henri Mendras specializes in the study of peasantry and French campaigns. In his acclaimed book, *La fin des paysans* [The End of Peasants] (1967), he analyzes the disappearance of the peasant production mode, replaced by professionals of the agriculture already ordained according to a capitalist and productive mode.

“Today, the second agricultural revolution disrupts the structures and the quiet balance is broken. It is the agriculture turn to ‘industrialize’ and French peasantry is killed, with more than 150 years late, by the civilization we name industrial.”

**9 Allan Savory (1935-)**

Zimbabwean biologist and ecologist, Allan Savory discovers, against the tide, that grazing can limit desertification. By compacting the soil, animals help to retain water in the soil and allow vegetation to take root. Influenced by André Voisin’s work, he develops a holistic pasture management method that allows for better carbon sequestration in the soil. Along with his wife, Jody Butterfield, they create the Africa Center for Holistic Management in Zimbabwe and establish the Savory Institute in Colorado with the goal of promoting large-scale soil restoration.

**10 Arne Næss (1912-2009)**

Considered as the most important Norwegian philosopher of the 20<sup>th</sup> century, great alpinist, resistant during World War II, Naess is an engaged ecologist. Influenced by Rachel Carson’s *Silent Spring*, he theorizes a new vision of the world (“Deep Ecology”), to oppose a form of ecology, called superficial, which focuses only on the reduction of pollution and the safeguarding of material resources in order to guarantee the current standard of living of rich societies.

“The well-being and flourishing of human and nonhuman Life on Earth have value in themselves. These values are independent of the usefulness of the non-human world for human purposes.”

**11 Rudolf Steiner (1861-1925)**

Austrian philosopher and educator, Rudolf Steiner is a forerunner of biodynamics, which he presents in a series of conferences in 1924 to assist farmers and scientists in finding again a profitable link with nature.

**12 Bhaskhar Hiraji Save (1922-2015)**

Indian farmer and activist, he developed a system of organic cultivation in a rice field and managed to stop using chemical fertilizers in 1960 by setting up an innovative system of platforms and trenches for the irrigation of fruit tree crops.

Engaged, he publishes in 2006 an open letter to the government to draw its attention

**13 Jean Dorst (1924-2001)**

French biologist and ornithologist, committed director of the National natural history museum from 1975 to 1985, activist against the harmful effects of the “Glorious Thirties” industrialization, Jean Dorst acquired a

**14 Joël Sternheimer (1943-)**

Mathematician and physician, also known under his singer name, Evariste, Joël Sternheimer coins the term ‘proteody’, association of the words ‘proteine’ and ‘melody’, which defines a series of harmonized sounds, showing

He theorizes anthroposophy, a doctrine convinced that there’s a spiritual world in which men once took part thoroughly by a form of dream consciousness, which has been reduced because of its attachment to material things.

towards the over-indebtedness of the farmers and the increase in suicide rates amongst them.

He opposes the Green Revolution which favored imports and massively introduced chemicals in India.

“To defy nature is suicidal.”

worldwide reputation with the publication of his book *Avant que la nature meure* (1965), in which he establishes the scientific foundations for what we will later call, biodiversity.

the existence of wave mechanics phenomenon through amino acids. He opens the field of experimentations for therapeutic applications on humans and animals, or to heal and rebalance ecosystems.

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**15 René Dumont (1904-2001)**

French agronomist, René Dumont is one of the firsts to ever denounce the harmful effects of productive agriculture, after having been one of its staunch supporters. In 1974, is the very first ecologist candidate in France. Always dressed in a red pullover and provided with an apple and a glass of water, he shares on television messages at the same time easy to understand and powerful about the shortage of natural resources due to human activities. In 1998, he is one of the founding members of Attac association.

**16, 17 Bill Mollison (1928-2016) et David Holmgren (1955-)**

Bill Mollison is an Australian biologist. Then a student in environmental design, he meets David Holmgren in 1974. They develop together the concept of permaculture, thought back then as the setting up of a global agricultural ecosystem for a sustainable agriculture. The concept is theorized in their book *Permaculture One*, published in 1978.

**18 Masanobu Fukuoka (1913-2008)**

The Japanese farmer devoted his life to developing an agriculture in accordance with his convictions, leaving nature to do its work and limiting human intervention to a minimum. He is the author of *The One-Straw Revolution: An Introduction to Natural Farming* (1975).

“Spreading straw might be considered rather unimportant, but it is fundamental to my method of growing rice and winter grain. It is connected with everything, with fertility, with germination, with weeds, with keeping away sparrows, with water management. In actual practice and in theory, the use of straw in farming is a crucial issue. This is something that I cannot seem to get people to understand.”

**19 Jean-Marie Pelt (1933-2015)**

Pharmacology researcher and writer, Jean-Marie Pelt is considered as a pioneer of ecology in France. His engagement has been at the crossroads of science, Christian faith, and activism. Pedagogue, he wrote more than fifty books and has also been radio chronicler and

director of two TV series, *L’Aventure des plantes* and *Des plantes et des hommes*.

He earned several awards thanks to his work, including the Legion of Honor in 1995.

**20 Lucien Séguy (1944-2020)**

French agricultural engineer, specialist in tropical agriculture, Lucien Séguy is considered as one of the precursors of the direct seeding technique on cover crops, which he notably

which he notably contributed to develop in Brazil. More respectful, this technique provides the soil with water, heat and nutrients necessary for the crops.

**21 Roger Heim (1900-1979)**

French botanist, Roger Heim is director of the National Museum of Natural History from 1945 until 1960. He writes the preface for the French translation of Rachel Carson’s *Silent Spring* in 1963, wishing this book would save from what he calls the “wreck of nature”.

“We arrest ‘gangsters’, we shoot at ‘hold-up’ authors, we guillotine assassins, we shoot at despots or so-called despots, but who will imprison public poisoners, instilling everyday products that synthesis chemistry delivers at their own benefits and at their recklessness?”

**22 André Voisin (1903-1964)**

French biochemist, agronomist and farmer, this pioneer of sustainable agriculture advocates for dynamic rotation of the herd in grasslands and better livestock feeding.

His two books, *Grass Productivity* (1957) and *Soil, Grass and Cancer* (1959), remain landmarks for worldwide researchers.

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**23 André Pochon (1931-)**

Son of a Breton farmer and farmer himself, André Pochon advocates for a peasant and sustainable farming. Along with his wife, Fernande, they renounced very early on the productive orientation promoted in the post-war period and carried out numerous experiments on grasslands.

“The farmer, designer and guardian of the landscape during previous centuries, has become the first destructor, encouraged and funded to accomplish this mischief. [...] Water, earth, air, are all being degraded by industrial agriculture, ancestral geological balance being broken by brutal techniques which negated the most fundamental agronomical laws.” *Les sillons de la colère*, 2006

**24 Wangari Muta Maathai (1940-2011)**

Known as “Mama Miti”, the mother of the trees, Wangari Muta Maathai is a Kenyan biologist and ecologist activist. In 1977, she founded the Green Belt Movement, aimed at mitigating the processes of deforestation and soil erosion by involving women in the process. Overall, this movement would have permitted planting more than thirty million trees. She has been the very first African woman to receive the Nobel Peace Prize in 2004.

**25 Raoul Francé (1874-1943)**

Austro-Hungarian botanist, microbiologist and philosopher, in 1906 he begins the publication of a monumental work, in eight volumes, *The Life of Plants*. His consecutive researches and publications constitute an important source for biological agriculture development during the second half of the 20<sup>th</sup> century.

“There is not a single botanist who would negate that plants are living beings. However, to contest their important quality and characteristic, the sensibility, it is precisely denying their life [...] There is no sharp jump in nature: the very same link ties us all in one wonderful unity.”

**26 Vandana Shiva (1952-)**

Physics doctor and Indian activist, Vandana Shiva is seen as pioneer in ecofeminism. Revolting against the agribusiness multinationals that seek to privatize life by patenting it, she founded the Navdanya association in 1991, which develops natural seed banks in India and supports the deployment of a peasant, organic, sustainable and local agriculture. She received the Alternative Nobel Price in 1993.

“The mechanical mindset has permitted humans to unleash their violence over other species, animal as well as vegetal. The vegetal mindset will contribute to helping plants, but it will mainly contribute to helping.”

In the second half of the 20<sup>th</sup> century, Europe developed an agricultural system guided by productivity, the consequences of which are increasingly visible: depleted lands, a threatened biodiversity, an overproduction and farmers who struggle to make a living.

A few amongst them are seeking and finding alternatives. Those we call “farmers-researchers” or “farmers designers” are experimenting new methods that aim at feeding while regenerating the soils and ecosystems, rather than exploiting them.

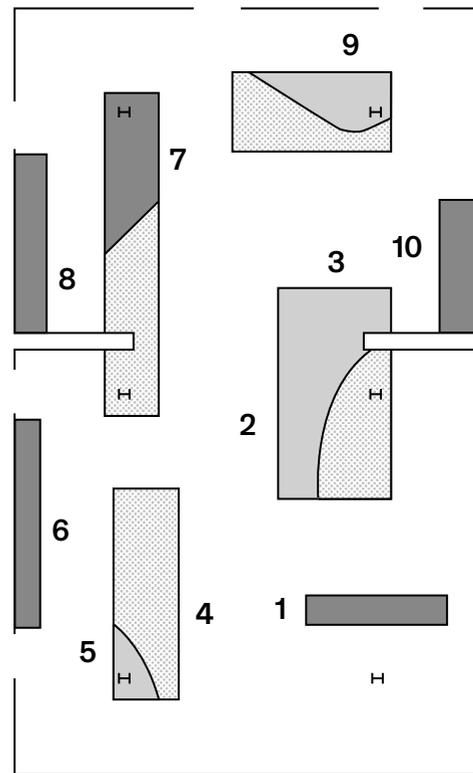
This is also a way of acting against climate change.

Their sources of inspiration are diverse, they draw from the systems’ intelligence and the natural cycles, they invite us to better capture and use each ray of sunlight, to preserve the life of the soil.

Like a designer, those farmers are inventing new farming and producing processes, taking into account the specific features of the context. They design light tools that are better adapted to the soil and use as little fossil fuel as possible.

At the heart of their concerns, the land, topography, rainwater run-off, sunshine, winds and the biological cycles of fauna and flora are all elements that the “farmer designer” observes to develop their land and promote virtuous links for the soil and its crops.

It is impossible to reduce these experiments behind a single label. We prefer here the more open term of agroecology.



## 1 The almanacs, partners of the necessary time

We are constantly struggling to condense time, this time that could be our tuning fork. We forget the rhythm of the seasons, which the thousand-year-old trees beside us remind us of. The Japanese have a word in their vocabulary to express the nostalgia of the passing seasons and our grandparents had an almanac to memorize the events and the passage of seasons.

The word almanac comes from the Arabic *al-munâkh*, which means climate or a moment in time. With the Bible, the almanac is one of the most printed books. An indispensable companion for the farmer, it provided all the information necessary for the work in

the fields: lunar calendar, festivals, dates and places of the markets, vegetable and horticultural advice, tables of decimal measures, information on new machines etc. This annual and often regional publication collected all the comments of its owner, thus preciously preserved from year to year: dates of sowing and harvesting, varieties of seeds used, weather indications etc. The simple events of daily life and private life were also recorded. Sometimes containing tales, jokes and elements of general culture, the almanac accompanied the life of the family throughout the year.

## 2 Odile Fabrègue and Christian Varin

Ahalen Lurrak Farm, Oneix, Pyrénées-Atlantiques

Ahalen Lurrak (“the lands of the possible” in Basque) is a five-hectare farm of woods, meadows, fruit trees, Galloway cows, a donkey, ewes and market gardening. When Odile and Christian took over this site at the bottom of a valley, it was covered in brambles. To promote biodiversity, they sow, prick out, plant, harvest and gather seeds: one hundred and seventy-eight varieties of vegetables are grown and over fifty varieties of tomatoes form an ecosystem in harmony with living things. The river that runs below – the Joyeuse – irrigates the land with the help of a solar-powered

pump. Certain crops are grown under a large mobile greenhouse near the seedling greenhouse, which is heated in winter by the ewes’ breath.

The lands of the possible regularly welcome partners, students and trainees, to whom Odile and Christian are keen to pass on their know-how. Their model is based on finding the right scale: a balance between the cultivated area and market sales. The farm is economically viable thanks to its systemic global approach.

## 3 Adama Dialla

Boulba, Ziniaré, Oubritenga province, Burkina Faso

Adama Dialla grows corn, sorghum, okra, bissap, sweet potatoes and peanut over three hectares. The different plots of land are also planted with fruit trees and leguminous plants that serve as livestock fodder such as pigeon peas. Raising chickens and sheep offers an income from the sale of the animals and makes it possible to produce aerobic compost that contributes to the fertile balance of the farm. As for many Burkinabé farming families, most of the production is consumed and the surplus sold at market.

Since beginning to farm in 1990, Adama's farming practices have changed a great deal, particularly thanks to her meeting in 2016 with the local association AIDMR, a Terre & Humanisme partner, which encouraged her to create an "agroecological island": managing soil fertility, creating and using different types of composting, combining and rotating crops, rationally managing water etc. This island presents a diversified production system of integrated crop and livestock farming, in which trees take pride of place. It is at once a green oasis, a family living space, an intensive production area that varies throughout the year, and a medium for experimenting with, demonstrating and sharing agroecological practices.

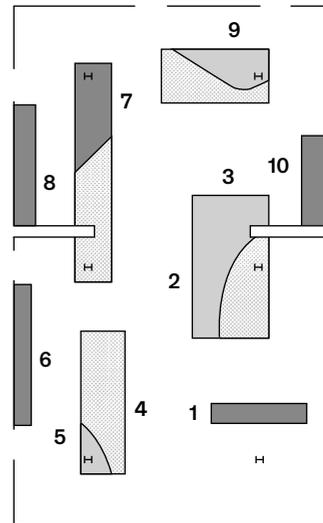
A pioneer in spreading agroecology, for over 25 years, Terre & Humanisme has been supporting those engaged in the transition to farmer agroecology in France, West Africa, North Africa and the Middle East.

## 4 Xavier and Séverine Noulhianne

Planté Farm, Montpezat, Lot-et-Garonne

On the strength of some twenty years' research and experimentation, Xavier Noulhianne has become an expert in meadows with a diverse flora and dynamic rotational grazing. In 2006 he came to the Planté farm, which extends over 14 ha, with his wife Séverine. There he set up a farming practice that is taking shape year after

year, beyond the regulatory framework, fuelled by a critical eye on farming organisation and its labelling system. He has embarked on an alternative, freer and more pragmatic path, imbued with common sense, to be able to make a living from the fruit of his labours rather than subsidies. Climate change and the need to find



solutions to adapt to the changes underway have led him to work hand in hand with Vladimir Goutiers, an agricultural engineer in fodder systems at INRA Toulouse research institute. Together, they are developing a meadow rich in several dozen varieties in Montpezat and do not tire of explaining the specific features and contribution of each of these plants.

With the milk from their sixty goats and forty ewes, Séverine and Xavier make cheeses whose flavours reflect the Planté environment. They sell them exclusively at the Chartrons,

Caudéran and Pessac organic markets. Xavier is the author of *Le ménage des champs : chronique d'un éleveur au XXI<sup>e</sup> siècle*, published by bout de la ville, 2016

"It's a new profession that entails new ways of working. I went to find out information where it exists, from scientists. We quickly began to turn to meadows with a mix of varieties. But which varieties? That's when we met Vladimir from INRA, who is working on the mixes of grass varieties."

## 5 Sepp and Josef Holzer

Krameterhof, Ramingstein, Austria

Now seen as one of the fathers of permaculture, Sepp Holzer took over his parents' farmland in 1962 at the age of 20. Situated in the Austrian Alps at a high altitude (1,100 to 1,500 metres), the farm is a 45-hectare estate that is often covered in snow. Despite the location, climate and original vegetation, Krameterhof quickly became a laboratory to test out new agroecological practices. Sepp and then his son Josef have made it a nourishing land by promoting biodiversity instead of fighting it. They develop a wide variety of crops there, incorporate different types of animal husbandry, and create a balance by encouraging interdependence between fauna and flora. The estate takes the form of a series of terraces inspired by Asian paddy fields. Rainwater run-off is controlled by the creation of over 70 ponds, lakes and pools connected to each other, making it possible to raise ducks, geese, fish and even crayfish. These water reservoirs encourage the development of an ecosystem (insects, snakes, amphibians) and make it possible to balance the temperatures. When a pond empties out, the water then follows a stony path specially designed to purify and enrich

it in oxygen, before reaching the next pond. This system of terraces offers soil with enough moisture for crops, but it also preserves the mineral-rich humus. Each plot of land is sown with a mixture of 40 to 50 different plants, the network of roots created stabilises the ground and prevents erosion. The slopes between each terrace are planted with fruit trees and coppice trees that provide biomass that is useful for feeding animals, heating and fodder and for improving soil fertility.

The organisation and distribution of the crops are based on the site's natural resources to create cycles incorporating the energy required for the crops (water, minerals, nutrients). The estate is designed so that the crops receive as much sunlight as possible. Trees, shrubs and bushes protect crops from the wind, preventing the soil from cooling and drying out. Microclimates develop in highly protected spaces that accumulate natural heat: plants that normally require warmer climate conditions flourish against rocks or behind hedges and walls.

## 6 Pierre Olivier Clouet

Château Cheval Blanc, Saint-Émilion, Gironde

As he was feeling the effects of climate change and the collapse of biodiversity more keenly in the vineyards, Pierre Olivier Clouet, Cheval Blanc's technical director and an agrosience engineer and oenologist, began around 2005 to build a farming model in which wine-growing is an integral part of a wider whole. A real ecosystem that makes room for mixed farming and boosts biodiversity. Animal farming, market gardening, orchards, flower gardens and beekeeping are now integrated into the vineyards.

The Cheval Blanc team has embarked on a vast programme of tree and hedge planting at the very heart of the plots of land. Their branches, foliage and trunks represent a host of opportunities for welcoming, sheltering and providing corridors for both insects and birds. Covered, untilled soil offers board and lodging for underground life (yeast, bacteria, fungi, earthworms, etc.) that now ensures soil fertility. Plant residues, along with some of the unharvested fruit, make up the pantry of many aerial and underground species. Specially arranged pools recover rainwater for watering, as well as initiating and developing a new ecosystem. The areas devoted to vegetable gardens, orchards and flower gardens are also set to increase in number. Two greenhouses for market gardening have been built to spread out the crops over time.

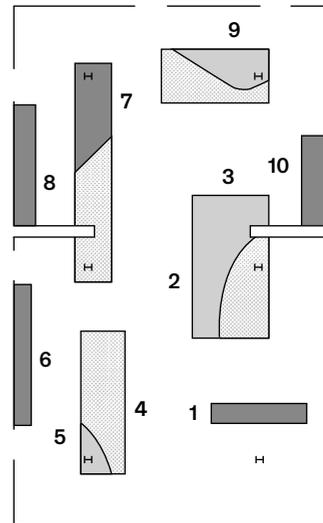
This work – whose primary aim is to preserve and even improve the wine produced on the estate – is carried out in tandem with different specialists, who are presented here, in dialogue with Pierre Olivier Clouet.

## 7 Ernst Götsch

Olhos d'Água farm, Pirai do Norte, Bahia, Brésil

The name of Ernst Götsch's farm refers to the 14 or so springs that the Swiss researcher and farmer has found on the estate since he moved there in the early 1980s. At the time, the ground was in an advanced state of degradation and earmarked for real estate projects. In the space of a year, Ernst planted cocoa and banana trees

and a host of other species over 500 hectares. Ten years later, researchers at the Brazilian Institute for the Environment were surprised to discover aerial views of the region showing a dense forest harboring productive crops. Ernst has adopted the term "syntropic farming" or "successional agroforestry" to define his



method, which consists in restoring the soil's fertility, reintroducing the water cycle and contributing to the virtuous functioning of ecosystems. This method starts from the premise that all species, both plants and animals, are part of the same organism that functions according to a cooperative rationale. Ernst Götsch's approach consists in encouraging natural processes.

We will never see Ernst Götsch without his Bowie knife and his machete: one of the bases of successional agroforestry is pruning trees, which creates a significant flow of ligneous organic matter towards the soil to help its regeneration.

"Pruning makes the plant increase its root activity, changing its mycorrhiza. One of the consequences of this new metabolism is the production of gibberellic acid, which induces plants to grow. New growth strengthens its symbiotic relationships with bacteria and fungi, resulting in nutrient production. This process fertilises the field. Pruning has a third effect on plants. The photosynthesis rate of pruned plants is higher than non-pruned ones, more photosynthesis means more sequestered carbon and it also means that more sunlight is being used, cooling the environment, which means more water."

## 8 Caroline Miquel

Les Jardins Inspirés, Le Taillan-Médoc, Gironde

Perrine and Charles Hervé-Gruyer are behind many agroecological vocations in France. Created in 2004, their farm, which spans 20 hectares in the Eure department, was and remains a benchmark site for permaculture. In partnership with INRA, AgroParisTech and universities, Perrine and Charles examine autonomous microfarm models on a regional scale, from an energy, organic and hydric perspective, as well as in terms of seeds and animal feed. A series of research programmes are conducted, taking nature as a model.

The entirely manual bio-intensive market gardening technique has proven productive and pertinent in creating a diversified agro-ecosystem and numerous sources of biomass.

Other work focused on increasing soil fertility and carbon storage, forest garden and edible forest concepts, along with increasing biodiversity. All these goals have been considered through the prism of permaculture, which positions each natural element so that it interacts positively with the others.

## 9 Sébastien Blache and Elsa Gärtner

Grand Laval farm, Montélier, Drôme

"Planting trees is not enough. You have to make an effort to bring in biodiversity. With as many living things as possible, we are optimising the possibilities of service provided. We trust nature."

In 2006, Sébastien Blache took over his grandfather's farm in the Drôme region, on the chemin de Grand Laval. Partnered by his wife, Elsa Gärtner, he turned these former intensive grain-farming plains into a wild farm

# A renewed agriculture

and a welcoming environment for biodiversity in which many ecosystems live side by side. A self-taught naturalist and ornithologist at the LPO (French Bird Protection League), he promotes a new model in which farming and the living world are inseparable and find the right balance together. For birds, insects and small animals, he plants hedges, creates aquatic micro-ecosystems in the form of pools and sets up dozens of nesting boxes tailored to different species. Chickens and ewes are raised with dynamic rotational grazing in the middle of the orchard, thanks to small infrastructures such as mobile chicken coops. Planting trees all over the farm and growing fruit, cereals and legumes significantly contribute to developing biodiversity. Thanks to the broad diversity of the crops present, the produce is processed and sold all year round directly on the farm.

His mission seems to have been accomplished when, binoculars around his neck, he spots a rare migratory bird taking a break on one of his plots.

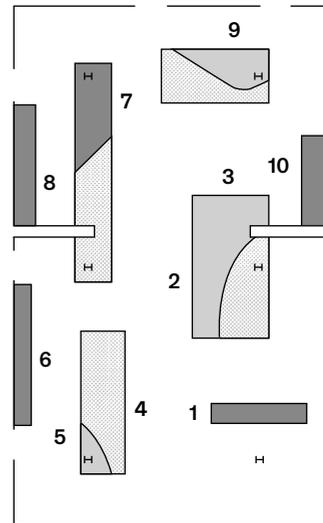
## 10 Perrine and Charles Hervé-Gruyer Le Bec Hellouin Farm, Le Bec-Hellouin, Eure

Perrine and Charles Hervé-Gruyer are behind many agroecological vocations in France. Created in 2004, their farm, which spans 20 hectares in the Eure department, was and remains a benchmark site for permaculture. In partnership with INRA, AgroParisTech and universities, Perrine and Charles examine autonomous microfarm models on a regional scale, from an energy, organic and hydric perspective, as well as in terms of seeds and animal feed. A series of research programmes are conducted, taking nature as a model.

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Other work focused on increasing soil fertility and carbon storage, forest garden and edible forest concepts, along with increasing biodiversity. All these goals have been considered through the prism of permaculture, which positions each natural element so that it interacts positively with the others.

# courtyard A



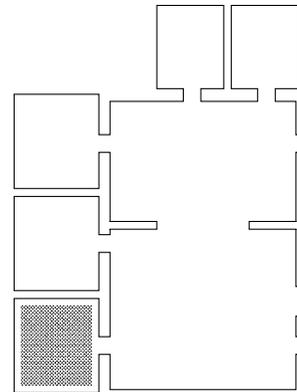
# Draw the landscape

By cultivating the land, man draws the landscape. Fields of corn, wheat, rapeseed, sunflower, vineyards, rice fields or orchards give the territories their identities. The species cultivated, the methods of cultivation and the irrigation techniques give birth to geometric shapes visible from the sky.

The industrialization of production methods has had a direct impact on the modelling of space. In the aftermath of the Second World War, the consolidation of land and the generalization of monoculture led to the creation of immense expanses, designed for increasingly sophisticated machines. In several regions of the world, circular fields have appeared over the last few decades. They are the result of the central pivot irrigation technique that depletes the groundwater, especially in desert regions such as Saudi Arabia, where satellite views taken between 1991 and 2012 show the development of this industrial agriculture.

Man has continually rethought the articulation between cultivated land, the practice of livestock and the buildings necessary for agricultural activity. From the Cistercian monks of the 12th century to more recent architects such as Le Corbusier and Frank Lloyd Wright, in each era he has relied on the geographical context, climate, available resources and existing traffic routes to imagine systems centred on human needs. A growing number of farmers who have adopted agroecological practices are now shaping a landscape that supports living things and promotes the development of biodiversity. The illustrations presented here of the TYFA scenario are a great indicator ("Ten Years For Agroecology in Europe"), which envisages the redeployment of natural grasslands and the extension of agroecological infrastructures (hedges, trees, ponds, stone habitats) on a European scale.

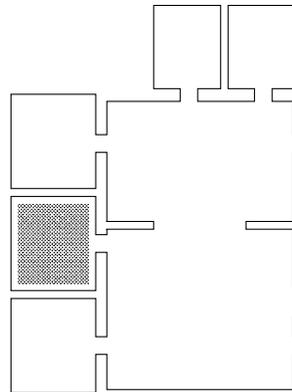
# cell 1



On another scale than the one imposed by globalization, other reciprocities are emerging, based on the sharing of knowledge, tools, materials and skills. Supported by farmers' groups and associations, these initiatives propose viable alternatives to the system of production, distribution and financing that has prevailed since the 1950s. The farmers thus aspire to regain their autonomy and control of their means of production.

Since 2009, l'Atelier Paysan, a non-profit cooperative, works with farmers to design tools and buildings adapted to their activity and to the scale of their production, by listing and freely distributing construction plans and by offering training courses throughout France. The cooperative also develops partnerships with numerous local, national and international organizations for research and experimentation.

L'Atelier Paysan regularly carries out Tours for the Identification of Farmhouse Innovations (TRIP), to collect, document, and chronicle adaptations, tips, and best practices related to farm tools and buildings.



## 1 The Aggrozouk

The Aggrozouk is a pedal operated tool holder, mounted on a height adjustable parallelogram. Lighter than a traditional tool holder and energy-efficient, it respects the soils and is particularly adapted to market gardening works thanks to the many tools it can combine: vibrocultivator teeth, harrow, ridging discs, hoeing stars, hoeing cages etc. The user controls the direction with

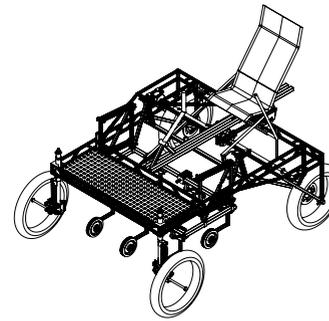
a crank on his right and pedals in the prone position, helped by an electric assistance (two 12V batteries of 100Ah) which can be connected to a solar panel. This tool was first developed by the Farming Soul collective, which then joined forces with the Atelier Paysan to ensure its adaptation to farmers and its dissemination through self-construction and free access plans.

## 3 The bread hoven

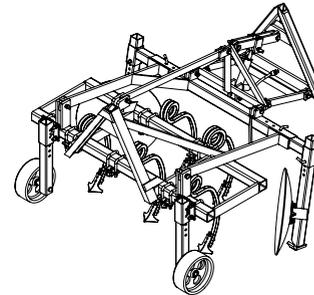
This bread oven is appreciated by small producers for its lightness, small size and ease of use. The bread is placed on two superimposed floors (i.e. on two levels) connected to a pivoting axis in the centre of a circular baking chamber made of rolledsheet metal, enclosed by an insulated circular wall. The fire is made in a fireplace under the cooking chamber. A space between the cooking chamber and the insulated wall

allows the smoke and heat to circulate. The indirect heating allows to chain the furnaces indefinitely. Contrary to traditional earthenware ovens, this oven has no inertia, so the heating is fast. It is very well insulated and therefore saves wood. With a capacity of 20 to 25kg of bread per batch, it is adapted to a mobile use or to small productions.

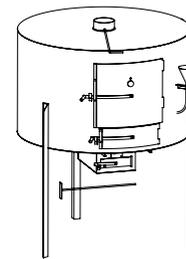
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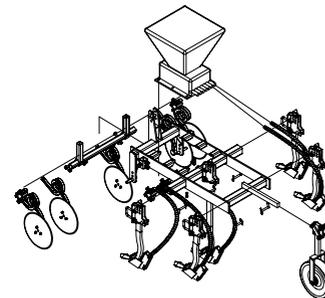
2



3



4



## 4 The green manure vineyard seeder

Some plants are cultivated in order to increase soil fertility and to improve its structure, but not for harvesting. This is called 'green manure'. The spontaneous vegetation that develops between the rows can play this role, but the establishment of green manure generally requires the seeding.

Developed by a Jura winegrower, this green manure seeder for vines quickly aroused the interest of other winegrowers in the region. The Jura organic producers' union then asked Atelier Paysan to design this tool with the agreement of its inventor. Designed with easily accessible metal profiles, it is now easily reproducible. Its frame has discs and seeding tines designed to work in direct seeding (without ploughing). The harrow tines serve to homogenize the distribution of the seeds and to close the furrows. The front-mounted spacing discs also help to distribute the seeds over the desired area. This seeder can easily be adapted to vineyard inter-rows wider than those for which it was designed.

## When the farmer takes over

cell 2

For two years, L'Atelier Paysan has been working with a group of farmers and a former slaughterhouse manager to design a mobile slaughterhouse project, which has not yet been finalized.

### SENDING AN ANIMAL TO THE SLAUGHTERHOUSE?

IN A SOCIETY THAT HAS INTEGRATED ANIMAL SUFFERING, MORE AND MORE BREEDERS ARE QUESTIONING THIS SENSITIVE SUBJECT. INSPIRED BY AUSTRIAN, GERMAN OR SWISS FARM SLAUGHTER MODELS, DIFFERENT HYPOTHESES HAVE BEEN DEVELOPED IN FRANCE SINCE THE 1990S. SOLUTIONS THAT ARE MORE OR LESS SATISFACTORY, MORE OR LESS COLLECTIVE.

OFFERING AN ALTERNATIVE TO THE INDUSTRIAL SLAUGHTERHOUSE MEANS ACCOMPANYING THE ANIMALS TO THE END, AVOIDING A STRESSFUL TRANSPORT AND DEATH, BUT IT ALSO MEANS OFFERING SOLUTIONS IN TERMS OF HYGIENE AND COSTS.

THE SPECIFICATIONS ARE EXTREMELY COMPLEX: SLAUGHTERING ON THE FARM, EVISCERATING, CUTTING UP, RECOVERING WASTE AND WASTE WATER, REFRIGERATING, TRANSPORTING AND PRESERVING.

SO, FACED WITH THIS DESIRE TO REAPPROPRIATE THE LAST STEP OF A CAREFUL AND RESPECTFUL BREEDING WORK, TO PRODUCE QUALITY MEAT FOR ALL, FARMERS ARE STILL QUITE HELPLESS.

THEY CAN KILL THE ANIMAL WITH A RIFLE IN THE FIELD OR SLAUGHTER IT IN A MOBILE STRUCTURE, THEN REFRIGERATE IT AND TRANSPORT IT TO THE SLAUGHTERHOUSE FOR CUTTING, OR USE A HUGE TRUCK WITH SEVERAL TRAILERS, A MORE EXPENSIVE AND LESS MOBILE SOLUTION.

MADE EVEN MORE DIFFICULT BY THE OMNIPRESENCE OF LOBBIES THAT PARASITIZE POLITICAL ACTION, AND BY A PART OF THE POPULATION THAT IS NOW OPPOSED TO ANIMAL EXPLOITATION, THE SUBJECT HAS NOT YET FOUND A CONSENSUS.

## Regenerate the soils Design for a fertile land

cell 3

Global warming and production-oriented agriculture have contributed to long-term soil degradation, especially in the driest regions of the globe.

Soil regeneration, which many researchers have been tackling since the 1970s, covers a multitude of methods and techniques. They aim to restore the land's fertility, rebuild the humus, revive all the life that makes up the soil and contributes to its richness.

From Brazil to India, through the Great Green Wall (GGW) in Africa, Southern Spain and the Loess Plateau in China, huge-scale regeneration projects have come to life over the past thirty years with the support of governments, financial aid from NGOs and foundations and the expertise of soil specialists. These vast areas spanning several hundred hectares are a testament to the success of large-scale agroecological methods, which lies in close collaboration with the region's farmers to pass on the techniques: no-tillage, plant cover, the principles of permaculture and agroforestry, holistic farming, better water management and improved irrigation techniques.

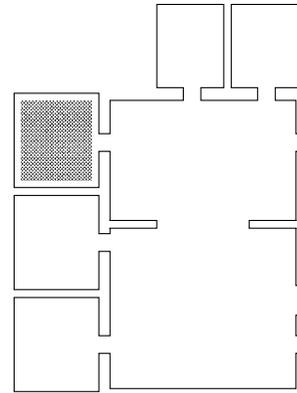
Large-scale soil regeneration allows farmers to produce again, even in the poorest and driest regions of the world. It thus puts into perspective this redundant question: who will feed humanity?

### Provinces of Grenade, Almeria and Murcia, Spain

Regeneration project coordinated by the AIVelAI association, supported by the Commonland Foundation

Founded in 2014, the AIVelAI association groups 250 farmers, breeders, entrepreneurs, researchers and citizens, spread over around 630,000 ha. It aims at regenerating the landscape and soils and to contribute to the economic improvement and independence of the region in the long run. The design of the restoration project is based on the "4 returns" model theorized by the Commonland Foundation (return of inspiration, social capital, natural capital and financial capital). It focuses on three areas and is designed to last 20 years.

Through an experimental farm where comparative agroecological research is conducted, local communities are involved in learning regenerative techniques for the soil: creation of artificial wetlands (albarradas), planting of tens of thousands of trees of indigenous and resistant varieties to increase biodiversity, use of compost, plant cover and perennial varieties to limit soil exposure and increase its fertility. The development and marketing of local products contribute to the economic and social regeneration of the territory.



# Regenerate the soils

## Design for a fertile land

### Loess Plateau, China

Project initiated by local people and the Chinese Ministry of Water Resources, coordinated by John D. Liu and supported by the World Bank

A historically fertile area, the Chinese plateau has been gradually reduced to desertification by intensive agricultural practices and overexploitation of natural resources. As a result, water cycles have been disrupted, leading to drought, dust storms, flooding and consequently lower agricultural yields, poverty and food insecurity.

Between 1995 and 2009, a team of Chinese and international experts was assembled to map the region and differentiate between areas of agricultural use and areas to be preserved for their ecological function in the ecosystem. Funded by the Chinese government and the World Bank, the program aimed to

reforest the region, restore a healthy water cycle and improve the living conditions of the farmers. Paid to contribute to this work, farmers were also involved and trained in sustainable agricultural techniques.

Thanks to the construction of terraces and small dikes capturing rainwater, the sedimentation of the Yellow River is controlled, and new cultivable areas have been created on the plateau. Massive reforestation has also helped to improve the soil structure and restore its fertility. Unrecognizable as a vast green paradise, the Loess Plateau is now recognized as a model of regeneration and erosion control.

### Senegal, Mauritania, Mali, Burkina Faso, Niger, Nigeria, Chad, Sudan, Eritrea, Ethiopia and Djibouti

#### The Great Green Wall

Initiated in 2007, the Great Green Wall consists in the creation of a 7,000 km long, along the Sahel, and around 15 km large, vegetal barrier. The goal is to regenerate one hundred million hectares of land by implementing integrated ecosystem management.

Because of its geographical particularity, the project aims to alleviate the security and humanitarian crises of the countries in the region, which are among the poorest. The colossal budgets invested by the countries and many international organizations should allow the deployment of many innovative techniques.

The planting of endemic species, adapted to the characteristics of the land, aims to sequester carbon dioxide in the long term and prevent soil erosion. For example, *casuarina equisetifolia* is intended for white dunes while *eucalyptus camaldulensis* is better adapted to yellow dunes, sheltered from the wind. Fruit species such as the date palm are also chosen to contribute to the nutritional balance of the populations and to fight against poverty.

Depending on the country, exposed soils are covered with mulch and micro-basins (*zai*) are dug. The organic debris placed in these basins attracts termites, which dig galleries that they line with their excrement. This technique

improves the fertility of the soil and contributes to its aeration. During the rainy season, these holes allow runoff water to be collected and sorghum, millet or any other plant adapted to the climatic conditions to be sown.

The Great Green Wall project, however, faces real difficulties due to the uneven involvement

of countries, unfulfilled commitments, and political and financial issues that hinder overall effectiveness. The project was recently revived at the One Planet Summit held in Paris on January 11, 2021.

### Andhra Pradesh State, India

#### Zero budget natural agriculture

Influenced by the principles of *Natural Farming* brought to India by Bhashar Save, the state of Andhra Pradesh has launched an ambitious policy to encourage organic farming. By 2024, 100% of the crops managed by some six million farmers should be converted. To address the plight of farmers and end their dependence on loans, zero budget natural farming is being advocated (ZBNF program, launched in 2016). This form of farming covers a set of natural and easily replicable methods that involve eliminating the expenditure of chemical inputs and achieving better yields. The use of

biofertilizers, installation of permanent ground cover and reduced tillage contribute to better water retention and increased biodiversity.

The methods implemented will help secure crops throughout the seasons, facilitate access to clean water, provide food for livestock, and help reduce chemical-induced illnesses, especially in children. Supported by the Food and Agriculture Organization of the United Nations (FAO), the program has already been joined by 700,000 farmers and agricultural workers, who are now out of debt.

### Brazil

Creative researchers and direct seeding under plant cover coordinated by Lucien Séguy

From 1977, Lucien Séguy, French agronomist, specialist of the tropical environments, initiates researches in Brazil within the framework of CIRAD (Centre for International Cooperation in Agricultural Research and for the Sustainable Development of Tropical and Mediterranean Regions). The stakes are to replicate the agricultural technique of direct seeding,

born in the United States in the 1940's in the geographical singularities of the South to find new sustainable alternatives to conventional agriculture.

Direct seeding is a system based on no-tillage, a permanent soil cover and crop rotations. The no-till farming method allows to keep the

# Regenerate the soils Design for a fertile land

clay-humus aggregates that fertilize the soil. The vegetation covers are the source of soil nutrition in carbon, nitrogen and phosphorus. They aim to protect the soil from erosion caused by tropical rains and to enrich the surface layer with minerals. Finally, crop rotations compensate for the disadvantages of intensive monocultures, limiting the proliferation of diseases and pests.

Lucien Séguy also seeks to make cultivated ecosystems function like a tropical forest

## Zimbabwe

### Holistic management with Allan Savory

In 2009, Zimbabwean biologist and ecologist Allan Savory theorizes the holistic management and contributes to its diffusion.

Holistic management consists in adapting planification techniques to biological needs. Thus, livestock grazing is planned: the trampling of herds of animals, whose numbers are increased, should mimic the "natural" movements

ecosystem. Like a recycling pump, large quantities of living and dead biomass are retained and reused in the system, thus regenerating soil fertility.

At the end of a few years of studying and with the help of producers, direct seeding techniques and crop succession have been developing to green millions of hectares in southern Brazil.

of wild animals threatened by predators. This method, which prevents over-grazing allows a periodic trampling of the soil which allows it to regenerate between grazing phase and to improve the carbon storage process.

In 2018, there were nearly 8,000 people trained in its principles, representing nearly 10 million hectares involved.

cell 3

# Water, a virtuous cycle

An essential condition for the presence of life on earth, water is a resource that has always been tamed throughout the world to serve cultures. Agriculture is the most water consuming activity, representing more than 70% of world consumption. From its abundant presence, cyclical or scarce according to the geographical zones, were born singular and ingenious irrigation practices. Its powers and the biodiversity it harbors have aroused the curiosity of researchers on various themes ranging from the memory of water to its dynamization.

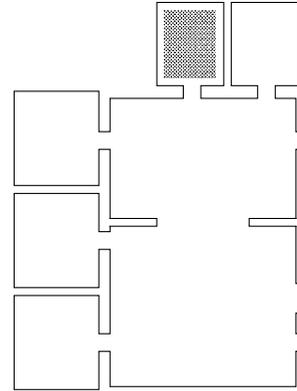
Should man intervene at all costs to control its flow and thus better store it? Here again, the functioning of living organisms leads us to consider water as a cycle that must be preserved and promoted.

*A three-day-old human embryo is 97% water.*

*During Summer, a mature oak tree can transpire up to 500 liters of water per day.*

*Fruits and vegetables are essentially made of water: 78% in wheat, 85% in a carrot, 95% in a melon.*

cell 4



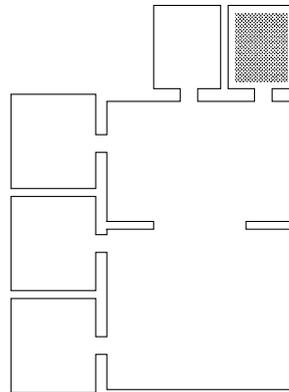
The plant world is far richer than we can imagine. Those who have been observing it with attention since the 18<sup>th</sup> century, are still discovering his potentials.

Around the world, sociologists, ethnologists, biologists are currently questioning the European point of view, forged during the modern era, of a universe where man, superior species, endowed with an intelligence and a conscience, is the master. Through that, they reconnect with the scientists who, during the 18th and 19th centuries, have demonstrated the genius of plants and their capacities to draw on the necessary resources for their growing, to communicate together and protect from eventual threats.

In his *Sleep of plants* (1755), Linné describes the capacity of a few of them to change their leaves' and flowers' position, at the time of the passage during day and night, a phenomenon called by modern botanists "nyctinasty". Later, Darwin in *The Power of Movement in Plants* (1882), explains that the apex, the tip of the root, acts like an animal's brain. Those root apparatuses are being deployed in the first movies of the German botanist Wilhelm Pfeffer in 1898.

Founder of the vegetal neurobiology, Italian Stefano Mancuso demonstrates the plants' capacity, to receive and transmit signals because of the chemical molecules produced by them. They elaborate solutions, fitted for their survival, frequently acting collectively. Mancuso does not hesitate to talk about the intelligence of plants, earning him many opponents.

And yet, with this term, it is not a question of humanizing the plants – we, indeed, talk about artificial intelligence – but rather to underline the interdependence of all forms of life on the planet and to show that Man, plants and animals belong to a very complex reality that goes beyond us.



"Can we talk about the intelligence of plants?"

Conference by Francis Hallé, biologist, botanist, specialist in the ecology of tropical forests and the architecture of their trees  
20 June 2018, Espace pour la vie, Montreal

"I was very reluctant for a very long time to use the term intelligence for plants. But the real question I ask myself now is, wouldn't plants be a lot smarter than us?!"

## Electroculture

In 1783, Pierre Bertholon published *De l'Électricité des végétaux* [About the electricity in plants] in which he studied the influence of electricity on the germination, growth, flowering and fruiting of plants. He attributed the nutritive virtues of rainwater to atmospheric electricity and designed a device capable of capturing the electricity present in the air. In 1912, France hosted the first International Congress on Electroculture. In his speech, the delegate of the Academy of Sciences was enthusiastic about this promising discipline. The "Fertilizers" of

the engineer Justin Christofleau were sold all over the world, more than 150,000 of them left the factories until the end of the production in 1939. And then nothing, or almost nothing. After the war, the intensification of agriculture is done exclusively with chemical inputs.

"For sixteen years, Mr. Christofleau's land has received no other fertilizer than the fertilizing virtue of the electricity thus captured, and the scientist has thus obtained abundant harvests." *Le Populaire*, March 3, 1931

Botanical biodynamizer

Joel Sternheimer (also known by his singing name, Evariste), is the inventor of the word proteody, a combination of the words “protein” and “melody”, which designates a series of harmonized sounds, directly tuned to the amino acids. Each amino acid has a scale wave that can be transcribed into a musical note that has a positive effect on the production of proteins in plants and animals. The melody created stimulates the living and results in the regulation of its biological processes or the formation of defense processes against pathogens.

Following the researches of Joel Sternheimer, Jean Thoby pursues phytoneurology studies

“The electrical stressing of water by means of electrodes made of very pure metals (98 or 99%) leaves a signature in the water that has an effect equivalent to that of the metals constituting the electrodes (Bignand-Violet process). Analyses are underway to try to identify the presence of dissolved species from the electrodes. Independently of these measurements, we know that if there is partial dissolution of the electrodes in water, the concentrations must be very low. This means that, as with homeopathic dilutions, the water is in fact “informed”, at the level of its coherence domains, by the electromagnetic signals from the electrodes.

in Gaujacq, (Landes, France) aiming at curing every plants without any synthetic molecule, including over very large surfaces.

In 2021, 22 farms and estates are using the botanical biodynamizer developed, outdoors or in greenhouses, from a few square meters to several hundred hectares. The effects are convincing: 50% less irrigation, regulation of all colonies of insects and fungi, improvement of the life of the soil, very significant increase in yields.

Through the LED, the water also receives information in the form of harmonic musical waves coming from a plant music, or proteodies calculated by the genodicists. These waves will interact with the scale waves emitted by any living being in growth, according to the theory of the physicist Joël Sternheimer.

Specific capacitors also allow the device to add, via the LED, electromagnetic frequencies coming from the breakdown of the dielectric of these capacitors in order to reproduce the equivalent of a rainstorm.”

Jean Thoby, June 2021

Larrous Farm in Bergouey-Viellenave, Pyrénées-Atlantiques

Originally from the Basque coast, Félix Noblia took over his uncle’s farm in 2011. He is one of those farmers experimenting with new techniques focused on soil conservation. Over his 150 hectares of mostly meadowland, he has adopted dynamic rotational grazing, which allows him to entirely grass-feed his Angus and Blonde d’Aquitaine cows. They do not stay on the same plot of land for more than a day so as not to deplete the soil and encourage regrowth. Félix does not use any crop protection products, develops the seedlings directly under plant cover, tests combinations of species and observes the best yields. The young farmer uses the new online platform Landfiles on which he shares his experiments, data and results.

Félix is also the mayor of his village, Bergouey-Viellenave, and vice-president of the association Fermes d’avenir.

Equipped with a GoPro, he shows us his daily life.

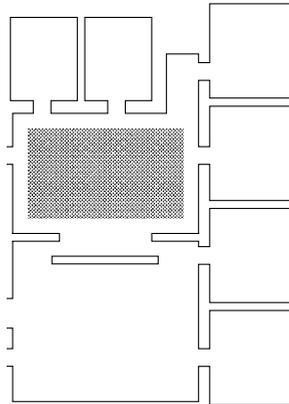


Pointed, sharp, slender, smooth or serrated, they are held in the hand and accompany the gesture. They allow us to work on materials and carry out a task. Gardeners, farmers, breeders, market gardeners and winegrowers transform them as they see fit to adapt them to the terrain and make them more effective. Forged for the most part until 1950, they were subsequently adapted to mass production on an industrial scale.

## Tools for an agroecological transition

U-fork, sifting broadfork, animal-drawn tools, straw cutter and tilther: all these light tools, easy to use, are reminiscent of models predating the industrialization of agriculture. They are now being used by a new type of agriculture based on agroecological practices. They help to work and preserve the soil and respect biodiversity. They are the result of collective intelligence and several years of experimentation, to which a growing number of associations and companies contribute, all driven by the need to promote the cycle of living things.

These tools were chosen in collaboration with Émilie Rousselou, head of the Domaine du Possible university. Spanning 136 hectares in the south of Arles in Camargue Regional Nature Park, the estate is part of the European network of large farms undergoing an agroecological transition, an initiative supported by the Tides Foundation and the Didier and Martine Primat Foundation.



## Vine pruning

Until the late 19th century, the billhook was the only tool used for pruning vines. With a single or a double hook, with or without a sharp heel or a nose, its shape and size varied according to regions, customs and uses. It was replaced by secateurs whose shape gradually deviated from it.

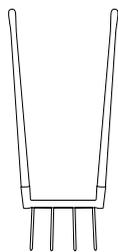
In the 1950s, forged steel was replaced by machined aluminum, which significantly reduced the weight of the tool. Among the innovations, the Swiss company Felco proposed a model that allows the replacement of blade and counter-blade when they are worn, a micrometric adjustment, handles designed for the hand and a system of opening and closing with the thumb via a simple ratchet.

In 1970, Felco developed the first pruning shears with a rotating handle, the *Felco 3*. The 45° rotation during cutting allows a better distribution of the muscular effort and significantly reduces the effort of pruning,

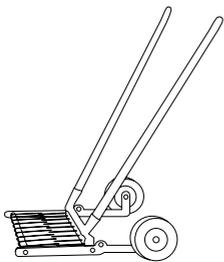
thus preventing the risks of tendonitis and inflammation. Its very symbolic red anti-slip coating avoids direct contact with the metal in cold weather.

Technical research continues with the release of hydraulic and hydropneumatic pruning shears, which precede the invention, in 1984, of the first electric pruning shears *Electrocoup* designed by Daniel Delmas. It was to be a resounding success, making Infaco the world's leading manufacturer of electric pruning shears. Pellenc launched its first electric model the following year, the *PE20*.

The first lead batteries weighing several kilos were replaced in the 1990s and 2000s by lightweight batteries weighing a few hundred grams. Pellenc was the first company to offer Lithium-ion batteries for hand-held power tools (*Lixion* model, 2004).



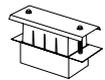
Grelinette



Campagnole



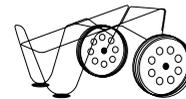
Tensiometer



Clod-press



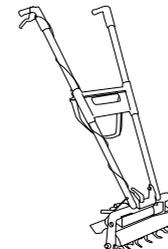
Harvesting cart



Planting carriage



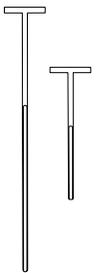
Mutineer hoe



Microcultivator



Pluviometer



Gouge auger

# Seeds, a living heritage

cell 7

The seed holds within it the embryo of reproduction of the plant world. It falls, rolls or flies away, spreading its species according to an uninterrupted natural cycle, before becoming the object of successive reasoned selections to obtain the most beautiful fruits.

In France, in the 1920s, the Institute of Agronomic Research and seed companies invested massively in varietal improvement, developing high-yielding plant varieties. Productionist agriculture has progressively replaced peasant varieties, considered too unproductive, by elite varieties, hybridized in laboratories. While these hybrid seeds allow for a significant increase in yields, they also require the use of large quantities of fertilizers and pesticides which, in less than half a century, have contributed to the impoverishment of the soil and biodiversity.

Their diffusion led to the exponential development of the seed market, controlled by a handful of multinationals, on which millions of farmers depend since seed has become a commercial good.

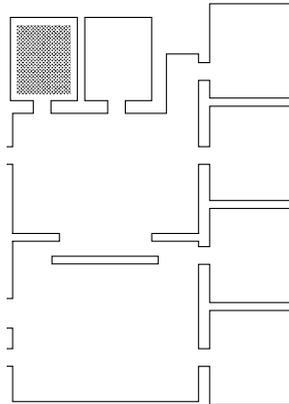
Sold or exchanged, every seed used for a commercial exploitation goal had, indeed, until 2020, to be a variety registered in the official Catalog. A non-registered variety did not have the right to be cultivated, nor commercialized on the national soil. The law No 2020-699 is now permitting commercialization but only to non-professionals.

Many market gardeners and association have worked over the past decades for the re-use of old seeds, reproducible and free of rights. Hardy and not very demanding in terms of inputs, they have a great genetic diversity which makes them adaptable to the soils and to the climate changes. The Semences Paysannes network and the Kokopelli association are among the actors who contribute to the conservation and dissemination of this living heritage in the fields.

Hybrids, farmers' seeds, or organic seeds are intrinsically linked to the issues of biodiversity and food. They are at the heart of the changes that have been initiated and appear as a precious element of our future.

This is that essential role that motivated, from 1925, the Russian biologist Nikolai Vavilov. He carries out more than 200 expeditions around the world and thus builds up one of the most extraordinary collections of seeds and herbariums to secure for its country an alimentary autonomy. The Pan-Soviet Institute of Applied Botany, which he headed, now bears his name and preserves this priceless legacy.

The museum warmly thanks the photographer and director Mario del Curto from the canton of Vaud, as well as Renaud Jussaume, a farmer and baker in Naves (Corrèze), and Matthieu Champeau, farmer in Saint-Simon-de-Bordes (Charente Maritime), whose beautiful ears of wheat, rye and spelt from farmers' seeds cover the walls of this cell.



# Sourdough, the unsuspected matrix of bread

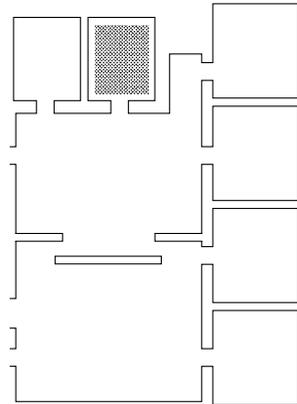
cell 8

A simple mixture of flour and water, bread is both the most basic food and the one that has become most symbolic over time. Its quality depends as much on the origin of the flours as on the time allocated to resting and baking, which can vary from 3 to 24 hours. These operations require a lot of space, which is not necessarily available in the so-called artisanal bakeries.

Like the vinegar mother, sourdough is a living material, a mixture of water and fermented flour, and which is a base to bread fabrication. Its aspect, odor and elasticity depend on a large number of parameters, including the nature and quality of the flour, the chlorine content of the water, the acidity of the baker's skin, the frequency of refreshments, the temperature, the altitude or the humidity level of the place where the sourdough is stored and worked. The leaven is thus playing a major role in the bread making process, it is the creative signature of a baker, when they make it themselves.

After having been replaced by chemical yeast at the end of the 19<sup>th</sup> century, sourdough is enjoying a revival because it develops, thanks to its acidity, proteases which have the effect of destructuring the gluten and making the bread easier to digest. Rich in probiotics and vitamins, sourdough bread keeps longer.

Puratos is one of the most important sourdough furnishers, composed flours or other mixtures to make bread, destined to artisanal and industrial bakeries. The Belgian society has made up a library which gathers more than 130 sourdoughs, coming from 25 countries, all over the world, which permitted to identify more than 700 wild leaven strains and 1 500 lactic bacteria. Researched and selected by Karl de Smedt, curator of this library, these sourdoughs are the property of the bakers who produced them.



# Three portraits of young farmers

Maina Chassevent  
Landless shepherdess, Pays Basque

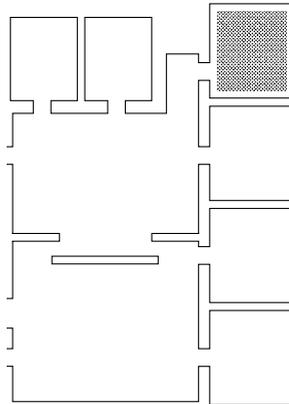
Nina Passicot  
Pig breeder, Lathus-Saint-Rémy, Vienne

Mikel Esclamadon  
Tea producer, Ustaritz, Pyrénées-Atlantiques

Three movies directed by Colombe Rubini and produced by Les films du Worso.

*FARMERS* draws the portrait of a new generation of farmers who decided to work accordingly to its ethic and to its ecological conscience. Shepherdess, breeder, tea producer, these three farmers rethink our relationship with nature and are involved in a positive transformation of our agricultural production system. Based on traditional know-hows, they develop their own working methods and adapt to today's climatic conditions.

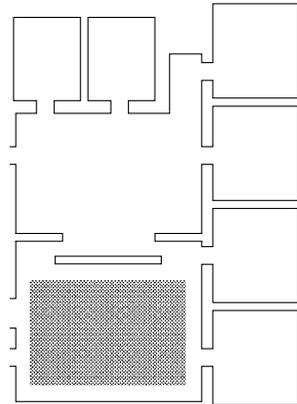
cell 10



# Real Facts

At the invitation of the musée des Arts décoratifs et du Design de Bordeaux (madd-bordeaux), second year Bachelor of Industrial Design students from ECAL/École cantonale d'art de Lausanne, accompanied by designers Erwan Bouroullec and Adrien Rovero, have given form to their observations and questions about the current agricultural landscape. *Real Facts* is a set of neophyte points of view on current agriculture, through the prism of design.

courtyard C



#1 Industrious  
Dario Aguet  
Fanny Bichet

#2 Selection  
Yann Cistac  
Masen Al-Saguir

#3 Labelling  
Louis Bosnjak  
Paul Carlu  
Camila Hidalgo

#4 Contrast  
Marine Bouvard  
Lucie Herter

#5 Holidays  
Frederik Buchmann  
Emma Casella

#6 Robotisation  
Alexandre Desarzens  
Sophie van der Bij

#7 Cycling  
Léon Felix  
Guillaume Gindrat

#8 Logistic  
Gabriel Hafner  
Alex Nguyen

#9 Iteration  
Nima Kaufmann  
Kim Lissy

#10 Balance  
Anaïs Lehmann  
Anaïs Rochat

#11 Conversation  
Timothée Lehmann  
Alexandre Margueron

#12 Women  
Lirjeta Maxhuni  
Théodore Simon

#13 Heritage  
Stéphane Mischler  
Constance Thiessoz

#14 Tree  
Jilian Reichlin  
Laure Wasser

In just a few decades, the evolution of production and distribution methods and the establishment of standards on an international scale have contributed to the standardization and transformation of life.

The second half of the 19<sup>th</sup> century saw the simultaneous development of serial production of foodstuffs (cereals, meats), of their storage means and transport (railway lines, cold stores) and the mechanization of their processing methods (tools, slaughter line). The devices that rationalized work in the Chicago slaughterhouses were a source of inspiration for Henry Ford when, in 1913, he installed the first assembly line for cars in Detroit, the famous Model T.

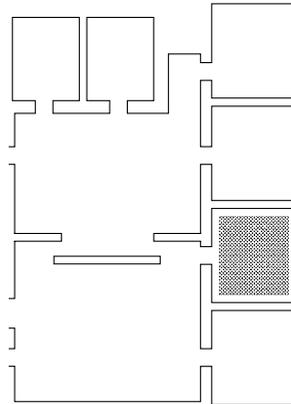
As early as 1948, the American historian of architecture and design, Siegfried Giedion, emphasizes the role that these technical progresses played in the development of industry: "If the automobile industry, for example, was able to develop its own assembly line system so quickly, it was because of the great habit the meat industry had acquired of working on a moving object."

Our perception of fruits and vegetables is widely influenced by that standardization: instinctively we associate colors, dimensions and forms to all the varieties we eat, and we doubt anything that moves away from it.

Our consuming modes have as well followed as encouraged this evolution: thus, the square watermelon mold meets the demand of Japanese households who want to minimize the size of the fruit in their refrigerator.

The blossoming of the agri-food industry has given rise to ersatz nature such as the disturbing egg bar and the latest cutting-edge research in biochemistry has led to the development of in vitro steak, also known as cultured meat, made from animal stem cells.

The objects presented here were selected by Victor Jacquard, designer, author of a thesis entitled Food Artefact defended at the ECAL/Ecole cantonale d'art de Lausanne in 2019.

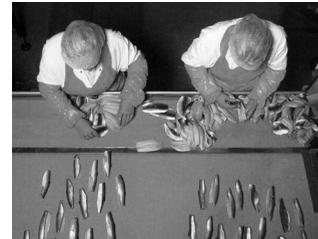


## On the walls Henk Wildschut, *Food series*, 2012-2013



*Office*

Since a walk to the centrally located office in the greenhouse complex takes about six minutes, there is a mini-office in the middle of each greenhouse. From here the managers monitor the climate conditions and keep a record of staff performance.



*Preparing*

Berthus-Dekker Seafood processes 1,000 tonnes of fresh and deep-frozen North Sea fish for export. After half an hour the herring, frozen to an overall temperature of -20 degrees, is brought back out on the conveyor belt.



*Characteristics*

These leaf discs are called lettuce programs and are used to test the resistance of the lettuces to Downy Mildew. From the results of these tests, breeders know which lettuce plants they can best cross to develop new resistant varieties.



*Examined*

In 2012 the animal welfare organization Wekker Dier ('Animal Awake') launched a campaign against industrially bred broiler chickens. The JA 957-type chickens of the organic broiler breeder Hubbard take ten weeks to grow into a bird of 2.8 kilos and consume exactly 6.5 kilos of feed. The chicken in the photograph is getting a health check from a vet at the request of Wakker Dier.



## *Semi-finished*

With brown poultry it is possible to breed a variety that makes a visual distinction between a hen and a cock. Using a conveyor belt, 20,000 brown and white chicks can be separated every hour.



## *Spring*

In 1997, Ruud van Schie of Nautilus made the change from regular greenhouse horticulture to organic production. The company has 2.5 hectares for tomatoes and 5 hectares for sweet peppers. Altogether, the Netherlands has 25 hectares of organic tomato production, most of which is exported to Germany and the UK.



## *-196°C*

A bull produces an average of 480 doses per approved ejaculation. Each such dose is collected in a straw. Altogether, there are some 600,000 straws in a container. The color, together with a code, name and date, makes each straw unique.



## *2,400 m<sup>2</sup>*

Torsius has three barns containing a total of 120,000 laying hens. These produce about 100,000 eggs a day, putting Torsius in the major league among hatcheries. The barns are minimally lit with special high-frequency strip lighting so that the chickens are kept calm.



## *Prototype*

Meyn is one of the world's largest producers of poultry slaughtering and processing equipment. The Meyn Whole Leg Deboner (WLD, here in a test setup) is a great success in the production of chicken leg fillet. Every year 8.5 billion of the world's 32 billion chickens are processed in equipment made by Meyn. A key feature is that each machine is made so that it can accommodate every variation in leg dimensions. As consumer preferences as regards the size and width of chicken legs varies geographically the company has developed machines that are easy to adapt to these preferences.



## *Cultivated*

Since 2012, Deliscious has been using LED lighting technology in a climate chamber, the first green lettuce cultivation company in the Netherlands to do so. The climate chambers are fitted out so that the lettuces grow at an optimum speed in ideal conditions, with an efficient use of space and independent of outdoor temperatures.

# **Misterien**

## **Barbara Schroeder**

**hôtel de Lalande**

"Barbara Schroeder looks at farmers, artisans of the earth, in a poetic way. She turns cow excrements into an ancestral mark carrying the memory of the indispensable relationship between living beings and nature. By reinterpreting this relationship and associating it with the basic shapes of architecture, the artist draws through their layouts the foundations of a structure for which we feel, little by little, the intimate experience: an archaeological wander, at once contemporary and symbolic.

By their accumulations and compositions, she creates singularities reminding the first man-made structures – such as the totemic figures or the habitats – making the archaic an edifying contemporaneity.

In the work "Misterien", Barbara Schroeder gives to this material a sacred and noble dimension: the cradle of the raw material stemmed from life. She profiles by this sensitive reinterpreted ordinary that represents the scrap, a beautiful parable of a circular and infinite "world-made-habitat". Thus, this work allows another surprising readability of the ills of our societies of waste and accumulation: their prodigious valorisations. Barbara Schroeder shows by these objects of curiosity, the treasure of the cycle of living things symbiosis."

Caroline Corbal Albessard  
Doctor and artist-researcher,  
associate member of the MICA research laboratory  
in the ADS section (Art Design Scenography:  
figures of urbanity), Bordeaux Montaigne University.  
Artistic director of the Metavilla creation studio  
and gallery in Bordeaux.

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La ferme de Planté à Montpezat

La ferme Idiartea à Bussunarits

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La ferme de Mikel Esclamadon à Ustaritz

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Le Domaine des Étangs à Massignac

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Pellenc

Puratos

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