MUSEO DI STORIA DELL'AGRICOLTURA

MUSEUM OF AGRICULTURAL HISTORY
ESSENTIAL GUIDE TO THE EXHIBITION PATH

INDEX

MUSEUM OF AGRICULTURAL HISTORY:

ESSENTIAL GUIDE TO THE EXHIBITION PATH

Edited by Osvaldo Failla and Anna Sandrucci

Texts by Lodovico Alfieri, Giacomo Bassi, Osvaldo Failla, Gaetano Forni, Giuseppe Frediani, Luigi Mariani, Francesca Pisani, Edoardo Rovida and Anna Sandrucci

Photographs by Anna Sandrucci and Osvaldo Failla

MULSA EDITORE

Museo di Storia dell'Agricoltura e Centro Studi e Ricerche per la Museologia Agraria ETS
Via Celoria 2, 20133 Milano

Version updated to January 2026

ISBN: 978-88-947927-8-2

PURPOSE AND EXHIBITION SITE

The **Museum of Agricultural History** (MULSA) is arranged as a sequence of exhibition spaces designed to narrate to the public the **history of agriculture**, **from its origins to the present day**, following a **chronological order** and employing **ethnographic, iconographic and biological materials**, together with models and dioramas. The exhibition areas aim to document the evolution of agriculture, namely the **history of crop cultivation and animal husbandry** for productive purposes, as well as the development of the associated tools and techniques. In addition to the narrative section, the Museum includes a series of **ethnographic spaces** displaying numerous agricultural implements, tools for craftsman activities linked to farming, dairy equipment, and objects from rural life. These artefacts were collected mainly in Lombardy, particularly from farmhouses (cascine) in the Lodigiano area, during the 1980s, and they document Lombard agriculture in the early twentieth century. Finally, there are three monographic rooms dedicated to **grapevines and wine**, **American Pre-Columbian agriculture** and to **land surveying and technical drawing**. The Museum is housed within the Visconti Castle of Sant'Angelo Lodigiano, owned by the *Fondazione Conte Gian Giacomo Morando Bolognini*.

Figure 1 – Panoramic view of the Bolognini Castle in Sant'Angelo Lodigiano (left) and of the Main Courtyard (right), which hosts the Museum of Agricultural History.

PRESENTATION OF THE MUSEUM

Figure 2 – Panoramic view of the Museum's introductory exhibition space.

In this area, visitors are offered a **general overview of the Museum's layout**. A carpet on the floor reproduces the plan of the Museum, complete with its legend, while objects placed along the perimeter are intended to **evoke the principal stages in the evolution of agriculture** in the Old World, such as: the birth of agriculture, represented by a manual stone mill for cereals; the introduction of the plough, symbolised by an Etruscan votive bronze figurine depicting a ploughing scene; the arrival of American crops, represented by a collection of maize ears; and the advance of mechanisation, recalled by a model of hand-operated machinery and by a model tractor. The exhibition also makes reference to the ethnographic section with two objects: a copper pot for cooking maize polenta and a butter mould, which remind us respectively of the modesty of the peasant diet and the richness of dairy production in the Lombard farmhouse.

THE AGRICULTURAL PLANET: MEANING AND EVOLUTION OF AGRICULTURE

A **large triptych panel** introduces the visit to the Museum, illustrating the fundamental themes on which the museum narrative of the history of agriculture is based.

The first part of the panel recalls how agriculture is at the same time: a source of food and goods essential for humanity; a mutualistic symbiosis between human beings, plants and animals; and a means of managing and strengthening the cycles of carbon and mineral nutrients. The central part illustrates, by means of a large map and a chronological chart, **centres and times of plant and animal domestication.** The third part, again through a large map, enables visitors to appreciate on a global scale the distribution of areas with different levels of agricultural and livestock intensity, and, at the same time, those that remain in their natural state.

Figure 3 – The introductory panel of the Museum.

FIRST SECTION: FROM THE NEOLITHIC TO THE ROMAN PERIOD

THE BIRTH OF AGRICULTURE AND THE DOMESTICATION OF PLANTS

Figure 4 – General view of the exhibition space "The Birth of Agriculture and the Domestication of Plants".

The section opens with a large panel entitled *"**From Predation to Domestication**"*, which summarises the conditions and ecological mechanisms that triggered the transition of human populations from a survival strategy based on hunting and gathering to one centred on cultivation and animal husbandry. This is followed by a large photograph of a forest fire, recalling how agriculture arose thanks to the **ecological effects of fires** deliberately set by hunter-gatherer communities. Displayed here are three hoes and one digging stick of African origin, similar to those used in the Neolithic, carbonised seeds, a model and fragment of a manual stone mill, and Neolithic flint blades. The second part of the exhibition space illustrates the phenomenon of **plant domestication** through a panel accompanied by two display cases, one containing maize ears and the other wheat ears. Completing the exhibition are examples of hulled and naked wheats, a large showcase illustrating the **phylogeny of wheat** through samples of ears of different species, and a series of transparent cylinders containing whole plants of wild, proto-domesticated and fully domesticated wheats.

THE DOMESTICATION OF ANIMALS

The first section also explores the concept of domestication and the chronology of the principal species of **domesticated mammals and birds**, while illustrating the **ethological traits** that predisposed certain wild animals to domestication. Dominating the space is a reproduction of a detail from the "***Hall of the Bulls***" **at Lascaux** (France), depicting an aurochs, ancestor of domestic cattle, accompanied by horses and deer. This cave painting, dating from the Late Palaeolithic, represents the complex relationship between hunter-gatherers and large wild animals: creatures regarded as indispensable prey but also feared, admired and venerated, a relationship which gradually evolved into a mutualistic symbiosis through domestication.

At the centre of the exhibition space is the skull of a Maremmana breed cow, discovered at an archaeological site in the Monti della Tolfa (Italy). The skull is compared with that of a cast of an **aurochs skull**, highlighting the morphological changes—especially in the shape of the horns—brought about by domestication. A model of a Tyrol Grey breed cow illustrates the morphology of modern dairy cattle.
The third panel introduces the concept of the "**domestication syndrome**", namely the behavioural, physiological and morphological changes that distinguish domestic animals from their wild ancestors. A visual example is provided by the comparison between the skulls of a wild boar and a pig. Also displayed are two symbolic artefacts: a reproduction of the Shahr-i Sokhta cup (3200 BC), decorated with an animated sequence of a goat, and a votive bronze figurine representing a zebu (2nd millennium BC). Above them, a spotted calf hide illustrates the importance of skins and coat colour patterns, traits acquired through domestication.
The fourth panel is devoted to the "multifunctionality" of domestic animals, listing the various roles they have played within human civilisations. Beneath it is displayed an ethnographic artefact: an awl in llama bone, originating from Bolivia.

Figure 5a – Panoramic view of the exhibition space "The Domestication of Animals".

Figure 5b – Left: bronze figurine representing a zebu (Near East, 2nd millennium BC). Right: Shahr-i Sokhta cup (Iran, 3200 BC), official reproduction from the National Museum of Iran, Tehran.

HISTORY OF THE PLOUGH

Figure 6 – Exhibition space dedicated to the "History of the Plough": panoramic view (left) and detail showing documentation of the plough in the rock engravings of Val Camonica (right).

The exhibition space opens with two large images devoted to the **earliest traces of ploughing and to the oldest plough discovered in Italy**. These are: the reproduction of a ploughed surface, created for ritual funerary purposes in the megalithic area of Saint-Martin-de-Corléans (Aosta), dating from the late 5th millennium BC; and that of a wooden plough unearthed in the Lavagnone Basin and now housed in the Civic Archaeological Museum of Desenzano (Brescia), dated between 2048 and 2010 BC. Displayed next are **five ploughs and a plough cart**, all implements still in use at the end of the last century, illustrating the millennia-long evolution of this instrument: from the symmetrical Neolithic ard plough to the double iron plough, via the one-wheel plough, the wheeled plough, the mouldboard plough, and finally the reversible plough. The space is completed by two panels and two casts depicting scenes of ploughing, documented in the rock engravings of Val Camonica, dating from between the 3rd and the mid-1st millennium BC. Alongside the reproductions of the engravings is displayed an axe/hoe from New Guinea, with a wooden handle and polished stone blade, still in use in modern times and virtually identical to those used by Neolithic farmers.

ANIMAL TRACTION: THE YOKE, THE TRAVOIS AND THE CART

This exhibition space traces the origins and evolution of animal traction through a **collection of yokes** from various Italian regions, a **reconstruction of a Neolithic travois**, and a cast of a **rock engraving depicting a four-wheeled cart with spoked wheels drawn by horses**. On the basis of traction-related bone pathologies observed in the fossil remains of domestic cattle, it is thought that the yoke was developed since the 7th millennium BC in northern Mesopotamia; from there its use spread across the Fertile Crescent and into the Mediterranean countries. Archaeological evidence suggests that the wheel, by contrast, originated with the invention of the potter's wheel in the 5th millennium BC, within the Cucuteni–Trypillia culture in present-day Ukraine. The idea of using the wheel for transport also developed in the Pontic–Caspian steppes, where intense cultural and commercial exchanges took place among peoples with different yet complementary lifestyles and productive economies. From the interaction between the Palaeo-Europeans of the Cucuteni–Trypillia culture, skilled makers of potter's wheels, and the Palaeo-Indo-Europeans of the Kurgan culture, there emerged, during the first half of the 4th millennium BC, the four-wheeled cart. The Kurgan pastoralists, indeed, required for their long migrations in search of good pastures, as well as for their trading activities, a

more efficient means of transport than sledges to carry household goods and merchandise. The cart then required only a few centuries to reach Mesopotamia.

Figure 7 – Collection of yokes used in Italian rural areas during the last century (left) and half-scale model of the travois depicted in a rock engraving from the first half of the 3rd millennium BC on Mount Bego, Maritime Alps, France (right).

Figure 8 – Cast of the engraving on Rock 23 of Naquane, Capo di Ponte (Val Camonica, Brescia), representing a four-wheeled cart with spoked wheels, dating from the Iron Age (last eight centuries of the 1st millennium BC), drawn by two horses yoked to the pole.

PROTOHISTORIC ITALIAN AGRICULTURE

The settlement of Sorgenti della Nova (Italy), considered proto-urban in type, comprised elliptical dwellings made of thatch, artificial caves dug into the tuff, animal enclosures, storehouses, open-air hearths and ovens. It is a site of great importance, documenting the agricultural activities of protohistoric populations of Italy, characterised by the cultivation of cereals and pulses and the rearing of sheep, goats, pigs and cattle. The

presence of no fewer than five ovens for bread-making and food preparation, together with animal enclosures and storage facilities for foodstuffs, attests to the intensity of both farming and livestock-raising activities, which were in any case always associated with the hunting of wild animals. The exhibition space presents **a model of a hut and one of an oven** referring to the proto-urban village of Sorgenti della Nova**.**

Figure 9 – Left: half-scale model of a shepherds' hut still in use in the Viterbo area in the 1980s. This hut is directly comparable to protohistoric huts whose traces were uncovered during archaeological excavations at the proto-urban settlement of the Late Bronze Age (9th–11th century BC) at Sorgenti della Nova (Farnese, Viterbo). Right: life-sized reproduction of a protohistoric oven also discovered at the archaeological site of Sorgenti della Nova.

ETRUSCAN AGRICULTURE

This space displays copies of several Etruscan **votive bronzes** of great significance for the documentation of Etruscan agriculture, as well as a life-sized copy of a **cinerary urn** depicting an Etruscan farmer defending himself from Roman military aggression by brandishing, in place of a weapon proper, the wooden plough from which he has removed the stilt. A display case also contains a series of **domestic ceramics** in which the influence of cultural and commercial contacts with the Greek world is evident. In the rural context, however, these coexist with traditional, coarser forms of pottery intended for everyday use.

Figure 10 – Left: reproduction of a bronze model of an agricultural cart, from a votive deposit of the 3rd–2nd century BC, Melona, Bolsena (Viterbo). Right: reproduction of a bronze model of a plough, from a votive deposit of the 3rd–2nd century BC, Talamone, Orbetello (Grosseto).

ROMAN AGRICULTURE

Figure 11 – Left: partial view of the exhibition space; right: cast of a relief depicting the tracing of the "sulcus primigenius" during the foundation of the city of Aquileia.

This section presents several panels reproducing scenes of cereal, vine and olive cultivation from various contexts of the Roman Empire. A display case contains a series of artefacts on loan from the Museum of Roman Civilisation in Rome. These are casts of: a sickle, a billhook, a small steelyard, a relief with satyrs treading grapes, another depicting a cutler's workshop, together with a yoke and a plough. Of particular significance is the cast of a relief dating from the 1st century AD, depicting the tracing of the ***sulcus primigenius*** during the act of foundation of the city of Aquileia, which occurred in the 2nd century BC.

PLOUGHING DIORAMA

Figure 12 – Pair of taxidermied Chianina cattle yoked to a symmetrical plough, on loan from the Museum of Roman Civilisation.

The **pair of Chianina breed cattle**, a breed typical of central Italy, recalls the white cattle of the Roman era. The coupling between animals and plough is secured by a long withers yoke, suited to large-sized cattle. The attachment of the pole consists of an iron ring hanging from a bracket passing through the centre of the yoke. The throat straps are formed by two wooden blades connected by a rope to the yoke and bound together at the bottom with another rope. The symmetrical plough (ard), of the so-called *Triptolemus* type, is wooden with an iron share and has no mouldboards. The stilt is made from a rough branch.

SECOND SECTION: FROM THE MIDDLE AGES TO THE GREEN REVOLUTION

THE RESTORATION OF AGRICULTURE AND THE DIORAMA OF THE PLOWING MONK

Figure 13 – In the foreground: diorama of the Ploughing Monk; in the background: a series of panels dedicated to woodland clearance, land reclamation, construction and life in rural villages, haymaking, livestock farming, hunting and fishing.

In the Middle Ages, lands abandoned after the fall of the Roman Empire were brought back under cultivation, and **new lands were cleared and reclaimed through deforestation, drainage, terracing, and the creation of irrigation networks**. New villages were established on land thus won for agriculture. These activities are documented here through iconographies drawn from various sources. At the centre of the exhibition space stands a **diorama depicting a ploughing scene** with a monk guiding a plough drawn by a taxidermied horse fitted with a padded collar. Introduced into Europe at the end of the 1st millennium AD, the padded collar made it possible to employ equine traction—faster than bovine—for heavy draught. Unlike earlier harnessing systems (the saddle yoke and breast strap), which tended to suffocate the animal under heavy strain, the padded collar, by reducing the angle of traction, enabled the horse to deploy the powerful muscles of its chest and shoulders without impairing breathing or damaging its hide.

CROPS IN THE MIDDLE AGES

Figure 14 – Panoramic view of the exhibition space "Crops in the Middle Ages".

This section illustrates the crops cultivated in the Middle Ages through a series of contemporary images, including reproductions of **miniatures from the *Tacuina sanitatis*** held in the Casanatense Library in Rome and **frescoes from the Torre dell'Aquila in the Buonconsiglio Castle in Trento**. The medieval farmer inherited a wide range of fruit plants already cultivated in Roman times. Among these were pome fruits (apple, pear, quince), stone fruits (peach, European plum, cherry and sour cherry), and other fruit-bearing Rosaceae trees such as the azarole and the medlar. Except for certain monastic contexts, specialised orchards did not exist; fruit trees were grown in mixed cultivation, in courtyards, gardens or in rows along arable fields. **Viticulture and olive growing** continued in the Middle Ages, perpetuating a tradition in Italy dating back to Pre-Roman times. In particular, many of the grapevine varieties of the Roman period were lost, while others appeared that remain important today. Olive oil was used both as food and as fuel for lamps. Also significant was the chestnut, present in Italian woodlands since the Roman period; its carbohydrate-rich fruit was a vital source of calories for mountain populations. As for herbaceous crops, medieval farming relied largely on species already known in Roman times. **Winter cereals** (bread wheat, durum wheat, spelt, barley, rye and oats) were of great importance, as were **summer cereals** (millet and panic grass, later joined by sorghum in the 14th century and rice in the 15th). **Grain legumes** (lentil, broad bean, chickpea, vetch, pea and cowpea) were also widely cultivated. Among **fibre crops**, flax persisted, and hemp was introduced, used for example in the making of ships' ropes. Tillage became more effective in the later Middle Ages thanks to the spread of the **mouldboard plough**. A wide range of **vegetable species** was also cultivated, including leafy vegetables (spinach, cabbage, chicory, celery, fennel, leek, beet, cardoon, artichoke, rhubarb, borage etc.), shoots (asparagus), root crops (parsnip, turnip, carrot, horseradish, celeriac etc.), bulbs (garlic, onion, shallot), fruiting vegetables (aubergine, melon etc.), and herbs (aniseed, parsley, mint, basil, rosemary, oregano etc.). A particular type of garden was the physic garden, typical of monasteries, where medicinal plants were cultivated to provide the active ingredients used in pharmacy.

PROCESSING AND SALE OF AGRICULTURAL PRODUCTS IN THE MIDDLE AGES

Figure 15 – Panoramic view of the space "Processing and Sale of Agricultural Products in the Middle Ages".

This space also makes use of **medieval iconography** through reproductions of miniatures from the Tacuina sanitatis of the Casanatense Library in Rome, frescoes from the Torre dell'Aquila in the Buonconsiglio Castle in Trento, and from Issogne Castle in the Aosta Valley. The display is further enriched by iconographic documentation of **watermills** from different parts of Europe. **Animal products** were transformed into cheeses and cured meats, which were traded and sold in urban markets. Their long shelf life made them suitable for transport over distance, but their production required not only animal raw materials but also additives such as salt and pepper—the former sourced from mines or marine salt-pans, the latter brought from exotic lands after long and perilous journeys. Other preservation techniques were also employed, such as smoking or storage in animal fat (northern Italy) or oil (southern Italy), to ensure the durability of animal products. Cereals had to be ground before being made into bread or polenta; here, mills powered by water or wind proved crucial. In the Middle Ages, mills were also employed for fulling, a process that thickened woollen cloth by felting. The use of water to power millstones had already been known to the Romans, but they made limited use of it, perhaps owing to the abundance of slave labour. In the Middle Ages, however, watermill technology spread rapidly. From the Early Middle Ages, floating mills also appeared: Procopius of Caesarea recounts that the first example in Italy was built on the River Tiber in the year 537 AD by order of the Byzantine general Flavius Belisarius, who was defending Rome during the Gothic siege. A scale **model of a floating mill on the River Adige at Verona** is shown in this section. The technology of floating mills remained widespread until the first half of the 20th century, as shown in some of the photographs reproduced here. The Middle Ages also saw the spread of the windmill, probably invented in Persia in the 7th century AD. This innovation made it possible to grind grain even when water resources were lacking or diminished, as during the dry Mediterranean summer.

RENAISSANCE AGRICULTURE

Figure 16 – View of the exhibition space "Renaissance Agriculture", focusing in particular on the agronomic writings of Agostino Gallo and Camillo Tarello.

The earliest agronomic treatise is the so-called ***"Sumerian Farmer's Almanac"*** (15th–16th century BC), which precedes by nearly a millennium the poem "*Works and Days*" by the Greek Hesiod (8th century BC), itself followed by that of Mago the Carthaginian (3rd century BC). Agronomic literature flourished in the Roman period, whose leading authors include Cato the Elder (234–149 BC), Marcus Terentius Varro (116–27 BC), Lucius Junius Moderatus Columella (AD 4–70), Pliny the Elder (AD 23–79), and Rutilius Taurus Aemilianus Palladius (5th century AD). From the Early Middle Ages comes the *Geoponica*, compiled in Byzantine circles in the 6th century; the Late Middle Ages saw both the Andalusian school, reaching its height around 1150 with the *Treatise* of Ibn al-'Awwām, and the revival of agronomic writing in the Latin West with the *Ruralium Commodorum*, composed around 1305 by Pier de' Crescenzi (1233–1320). The Renaissance marked a new flowering of agronomic literature, the result of advances in farming techniques and scientific knowledge, together with the advent of movable type printing (1455), which decisively fostered the spread of texts. Among the Renaissance authors, special mention should be made of the Spaniard Gabriel Alonso de Herrera (1470–1539), the German Konrad Heresbach (1496–1576), the Frenchman Olivier de Serres (1539–1619), and the Italians Agostino Gallo (1499–1570) and Camillo Tarello (1513–1573), both from Brescia province and citizens of the Venetian Republic. **Agostino Gallo**, in his treatise *Le venti giornate dell'agricoltura et de' piaceri della villa*, definitively published in 1572, provides a vivid portrayal not only of farming and animal husbandry practices but also of cheese-making and winemaking. An appendix to the work contains 19 plates illustrating various craft and agricultural implements. **Camillo Tarello of Lonato** authored the *Ricordo d'agricoltura*, published in Venice in 1567. A champion of innovation in agriculture with a distinctly practical economic aim, in his treatise he described a new four-year crop rotation system consisting of two years of clover, one year of winter cereals, and one year of bare fallow. The Venetian Senate granted him the exclusive right to distribute his book and a royalty to be paid by anyone adopting his method. The book's structure departs from the traditional Crescenzi-style comprehensive treatise, consisting instead of short entries arranged alphabetically—a genuine technical manual.

LEONARDO DA VINCI AND THE SFORZA

Figure 17 – Panoramic view of the exhibition space dedicated to Leonardo da Vinci and the Sforza.

The Renaissance marks the **dawn of modern scientific thought**. In this period, scientific speculation and technical achievement—paths which since the end of the "Hellenistic Revolution" had proceeded separately and seldom intersected—began to converge and to influence one another. Thus arose a technology in which scientific results were increasingly applied to the development of artefacts, which, while improving efficiency, in turn stimulated further scientific progress through their very construction. For example, the improvement of suction pumps prompted deeper studies on the vacuum, leading to refinements in machinery such as devices for extracting water from mines. An emblematic Renaissance figure is Leonardo da Vinci, active in many fields including those related to agriculture. He studied and designed canals for irrigation as well as for powering mills. To this end Leonardo drew topographical maps with surveys and measurements. Beyond studying canals, he also designed machines for their construction. Among his surviving drawings, gathered in various codices, are designs for a canal-digging machine and another for removing silt from canal beds. The exhibition space also features a scale model of the front part of the ***Cascina Sforzesca*** with its two corner towers (*colombaroni*) and the double-wing layout of the adjacent irrigated meadows (*prati marcitoi*). This innovative agricultural building, commissioned by Ludovico il Moro near Vigevano and completed in 1486, was intended purely for farming purposes: there was no stately villa, but only stables, haylofts, granaries, workers' dwellings, and the steward's residence.

The Sforzesca, a closed-court building, constitutes a true prototype for later Lombard rural architecture, owing to its grand scale and rigorous functionality. Leonardo stayed there in 1494, conducting studies on water movement, on irrigation and drainage problems tackled at the farm, and on the six hydraulic mills operating there. The display also includes a model of a watermill similar to those studied by Leonardo.

IRRIGATION

Figure 18 – Panoramic view of the exhibition space "Irrigation".

This section places particular emphasis on a series of **images of different irrigation methods**, demonstrating the vital importance of water in the development of agriculture, with special reference to the network of irrigation canals that today characterises Lombardy and, more generally, the whole of northern Italy. Since the earliest times, farmers had perceived the importance of water for productivity by observing the vigour of plants growing along rivers and streams during dry summers. **Irrigation increases and stabilises the yields** of summer crops such as meadow grass and maize, the **foundations of dairy cattle farming** in which Lombardy has traditionally excelled. This explains the flourishing of irrigation practice in the Lombard plain, served by a network of canals of impressive density and extent (totalling some 40,000 km). For centuries this network has provided water for irrigation and civil uses, mechanical energy for machines (mills, forges, rice-husking mills, etc.), and waterways for the transport of goods. Canals also served **to reclaim land by draining excess** water and making once marshy and malarial areas healthy and cultivable. The importance of land reclamation works is evoked here by a horizontal-axis screw from a pumping station. The display also includes a bust of **Arrigo Serpieri**, author of the 1928 law on "integral reclamation", recalling the importance of legislation on irrigation and drainage, which in Lombardy has long been exemplary at a European level. Also shown is a model of a ***prato marcitoio***, with its characteristic double-wing layout. These irrigated meadows, watered continuously in autumn and winter and according to normal irrigation turns in summer, produced a winter flora essentially composed of *Lolium multiflorum* ssp. *italicum* (Italian ryegrass), while the summer flora was typical of permanent meadows (*Dactylis glomerata* – cock's-foot, *Festuca pratensis*, *Trifolium repens var. giganteum* – ladino clover, etc.). From the *marcita* nine or ten cuts could be obtained each year; the grass, often cut daily—especially in winter—was used fresh, while in summer it could be used either green or dried as hay. The *marcite* dominated the Lombard landscape below and around the line of springs (*risorgive*) from the Middle Ages until the 1960s–70s, when they rapidly disappeared, no longer suited to new cattle-feeding systems, the requirements of agricultural mechanisation, and the challenges of water pollution and rural urbanisation.

CAMILLO BENSO, COUNT OF CAVOUR, AND AGRICULTURE

Figure 19 – Panoramic view of the exhibition space dedicated to Camillo Benso, Count of Cavour.

This exhibition space highlights the highly innovative aspects of the agricultural activity of this illustrious figure, who worked on his family's estates in the Vercelli plain and the Cuneo hills, introducing significant **innovations both at farm and territorial level**. The space also features prints dedicated to the **Cavour Canal**, a work of fundamental importance for the agricultural development of the Po Valley. Camillo Benso, Count of Cavour (1810–1861), before becoming a statesman and father of a united Italy, was a successful agricultural entrepreneur. Having abandoned his military career in the corps of engineers in 1831, Cavour first undertook a series of journeys across Europe in order to observe at first hand the innovations taking place in agriculture—a very rare initiative for Italian landowners at the time. On his return, he began managing the three family estates in the Vercelli area (Leri, 480 ha; Montarucco, 471 ha; and Torrone, 296 ha), large rice-growing farms worked by wage labourers. In addition, he rented nine farms near Grinzane (Cuneo), the site of the family castle. Among the innovations introduced by Cavour on his estates in the plain were the **mechanisation of rice threshing**, the use of **guano and mineral fertilisers** (nitrogen and phosphorus), the extension of **irrigation**, and the adoption of **tile drainage** to remove excess water from paddy fields. Of great significance was his constant attention to markets: he personally oversaw the purchase of inputs and the sale of produce. Cavour also founded a discount bank to finance agricultural innovation, promoted the establishment of a rice mill, and in 1847 created the first Italian chemical industry for the production of mineral fertilisers for agriculture. He conceived the idea of forming the *Irrigation Association of the Western Sesia District*, a consortium of landowners whose estates could be irrigated. The association was established in 1853 and immediately signed an agreement with the government for the lease of water rights. Another major work associated with Cavour is the Cavour Canal, one of the nineteenth-century irrigation works that profoundly changed the face of Italian agriculture. As Minister of Agriculture, Cavour also instructed the Royal Academy of Agriculture in Turin to study the **grapevine disease oidium**, introduced into Europe from America in 1847 and first reported in Italy in 1850, and to identify a remedy. At the end of the study, the results were presented at an extraordinary meeting on 10 September 1851, which recommended sulphur as a means of control.

THE GREEN REVOLUTION

Figure 20 – Panoramic view of the exhibition space dedicated to the "Green Revolution".

The twentieth century witnessed two unprecedented events in human history: an **enormous demographic growth**, with the world population quadrupling from 1.5 billion in 1900 to 6 billion in 2000; and an **extraordinary increase in agricultural production**, which also quadrupled between 1900 and 2000, despite only a modest increase in cultivated land. This latter phenomenon, known as the **Green Revolution**, effectively averted a demographic crisis. The Green Revolution was the result of massive technological innovation, beginning in the 1920s–1950s, following the application of numerous scientific discoveries of the nineteenth and twentieth centuries. Among its effects were a decline in the absolute numbers and percentages of people living below the food security threshold, and an increase in life expectancy. Furthermore, the **intensification of agricultural activities in the most fertile and suitable areas**—such as plains and low hills—made it possible to increase yields per hectare, meeting the growing demand for agricultural products without expanding cultivated surfaces. This approach helped **preserve natural ecosystems,** such as grasslands and forests, which would otherwise have been sacrificed to make way for new fields. This exhibition space shows how the Green Revolution profoundly transformed plant and animal genetics, the cultivation techniques of crop species, and livestock-rearing methods. The display includes a **gallery of symbolic figures** (from de Saussure to Mendel, from Vavilov to McClintock) and objects related to the innovative technologies introduced in twentieth-century agriculture: scale models (tractors, combine harvesters, etc.), inputs (seeds, pesticides, fertilisers, etc.), and instruments supporting the management of cropping systems (e.g. meteorological sensors, soil analysis equipment). The Green Revolution also brought with it a series of **environmental problems**, including the overuse of synthetic fertilisers and pesticides, leading to soil and water pollution; the excessive use of brackish water for irrigation, causing soil salinisation; and inappropriate tillage on sloping land, which resulted in erosion. To address these challenges, more **environmentally friendly technologies** are now being promoted, such as precision agriculture, conservation agriculture, and integrated pest management. Outstanding issues also include the conservation of foodstuffs, with significant food losses, particularly in low-income countries where, owing to limited energy resources, proper storage strategies cannot be applied.

THIRD SECTION: THEMATIC ROOMS

THE GRAPEVINE AND WINE

A B

C D

Figure 21 – Four views of the exhibition space dedicated to "The Grapevine and Wine": A) origins and diffusion of viticulture; B) ancient and ethnographic evidence of the vine and of wine in Lombardy, and present-day vineyard landscapes; C) wine in religions; D) wine in social life. Beneath the panels are displayed numerous objects used for winemaking and wine storage.

This section traces the **millennia-long history of viticulture and winemaking in their historical, religious and cultural aspects.** The full domestication of the vine dates to the 4th millennium BC in the Levant and southern Caucasus. The production of wine, however, precedes the domestication of the grapevine by at least two millennia and is thought to have originated in the southern Caucasus, where the fermentation of grapes harvested from wild grapevines had already acquired an important productive and cultural significance. From these regions, the culture of the vine and wine spread to Anatolia, Mesopotamia, the Levant, Egypt, and the Mediterranean basin. The first panel recalls the **significance and earliest evidence of alcoholic beverage production**, based on archaeological and ethnographic data. A large map of the Old World illustrates the chronology of vine domestication and the spread of viticulture. Further displays present the cultivation and winemaking techniques of the earliest civilisations, the role of wine in religion and society, and the earliest evidence of viticulture and wine consumption in Lombardy. One panel documents vine cultivation and winemaking in Lombardy at the beginning of the 20th century, and another depicts several contemporary vineyard landscapes in Lombardy. Beneath the panels are placed numerous objects including small barrels, vats, large and small *brente*, *brente* adapted into tanks with pumps for pesticide treatments, bottling and corking devices, and other equipment.

AMERICAN PRE-COLUMBIAN AGRICULTURE

Figure 22 – Overview of the exhibition area dedicated to "Pre-Columbian American Agriculture".

In Pre-Columbian America, populations with highly diverse economies coexisted. Alongside societies based on **intensive agriculture**, such as the urban empires of the Aztecs and the Incas, there were communities—especially in the Amazon and North America—that practiced **shifting cultivation**, complementing it with hunting and the gathering of wild plants and animals. A wide variety of plant species were domesticated, each associated with specific **centres of domestication**: Central America – maize, summer squash, beans, chili peppers; Northern South America – sweet potato, cacao; Andean region – potato, tomato, bean, tobacco; Amazon region – peanut, pineapple, manioc, winter squash; Southwestern North America – sunflower. Domesticated animal species were far fewer: the turkey in Central America, the muscovy duck in northern South America, and in the Andean region the llama, alpaca, and guinea pig.

The exhibition space features two significant iconographic reproductions documenting Pre-Columbian agricultural practices in the Andean and North American civilizations. These include the Monthly Plates by Poma de Ayala (1534–1615), illustrating the **cultivation cycles of maize and potatoes among the Inca**, and a watercolour by John White (1539–1593) depicting the **agricultural activities of the Algonquian peoples of North America**. A large display case presents several **varieties of maize ears**—the symbolic plant of American agriculture—shown alongside those of teosinte, its wild ancestor. Another case exhibits ceramic vessels from Peru shaped like sweet potato tubers, maize ears, squash fruits, and the heads of llamas and muscovy ducks. A taxidermied turkey highlights the importance of this gallinaceous bird native to North America; behind it, a large panel depicts a llama beside the impressive agricultural terraces of an Inca archaeological site in Peru. A monitor displays a slideshow dedicated to the main centres of domestication and to the plant and animal species domesticated across the American continent. In a large drawer, visitors can view a collection of American beans, wild potatoes together with samples of raw llama and alpaca wool, compared with the coarser wool of sheep.

LAND SURVEYING AND TECHNICAL DRAWING

Figure 23 – View of the exhibition space dedicated to "Land Surveying and Technical Drawing".

Located on the floor of the Main Courtyard and accessible from the Sala del Presidio, this exhibition space houses an **original collection of technical drawing instruments used between the 18th and 20th centuries**, donated to the Museum by Professor Edoardo Rovida. This collection documents one of the foundations of agricultural development: technical drawing, essential to the design of machinery, livestock housing, storehouses, irrigation works, cadastral maps, and more. Complementing this is a collection of **instruments for land surveying**, an indispensable support for that "*certainty of boundaries*" without which agricultural development could never be achieved. The advent of agriculture in the Po Valley over 6,000 years ago brought substantial changes to the landscape, first through deforestation and subsequently through the use of the plough—introduced more than six millennia ago—which imposed the rectangular form of fields. In Roman times, landscape modification became systematic with the spread of ***centuriation***, the grid-based division of land, the traces of which remain visible today in many flat areas of Italy, as well as in other European and North African countries once under Roman rule. In Britain, however, Roman dominion did not last long enough to consolidate the practice, and the boundaries of fields often remain those defined in Pre-Roman times, especially during the Iron Age. The *centuriation* grids were laid out by land surveyors using the ***groma***, a topographic instrument, a full-scale reproduction of which is displayed here. Among other instruments on display are: the ***tavoletta pretoriana***, used in the 18th century for the cadastral survey commissioned by Empress Maria Theresa; the ***squadro agrimensorio***, an optical instrument and the modern analogue of the Roman *groma*; and a **theodolite**, an optical instrument with a telescope for measuring azimuthal (horizontal plane) and zenithal (vertical plane) angles. Also noteworthy is **a caliper used for measuring the diameter of tree trunks** in forest inventories.

FOURTH SECTION: LOMBARD AGRICULTURE IN THE EARLY 20th CENTURY

PASTORALISM IN THE ALPINE VALLEYS

Figure 24 – Panoramic view of the exhibition space dedicated to "Pastoralism in the Alpine Valleys".

This section displays a series of objects linked to sheep and cattle farming, dairy and wool processing, and **Alpine fodder production**, originating from the Mountain Museum of Premana (Lecco). In one corner of the room, a reduced-scale reconstruction of a **typical shepherds' hut** is presented, built of dry stone with a pitched *beola* roof. Three taxidermied sheep—a ram, an ewe and a lamb—lend vividness to the scene. In the Alpine–Po Valley context it is necessary to distinguish between two systems. The first is true pastoralism, centred on sheep farming and based on seasonal transhumance between the plain and the mountains, along the great routes of the Po Valley and their connected valleys. Such movements covered several hundred kilometres each year: for example, from the upper Bergamasque valleys to the lower Adda plains and sometimes even as far as the Adriatic coast, and back again. This practice has an extremely ancient tradition, dating back to the Late Palaeolithic, when hunters followed herds of wild herbivores (such as deer) on their seasonal migrations between mountain and plain. Closely related to transhumance is *alpeggio*, typical of the peasant communities of the mountain valleys. Each family owned one, two or three head of livestock—usually cattle, but often also sheep and goats—which were driven *"to the mountain"* (summer pasturing) with the arrival of fine weather: first, in April–May, to the mid-altitude meadows known as *maggenghi*, and later, in summer, to the higher pastures, the *alpi* (or *malghe*). In September the return journey was made. In some valleys, summer pasturing was entrusted especially to young women, as in Valvarrone at Premana, since in the wider valley bottoms men devoted themselves to agriculture and the collection of winter fodder. In poorer valleys, men engaged in crafts; in Premana, for example, in metallurgy. Elsewhere, livestock were entrusted to a hired shepherd.

THE ORGANISATION OF THE LODIGIANO FARMSTEAD

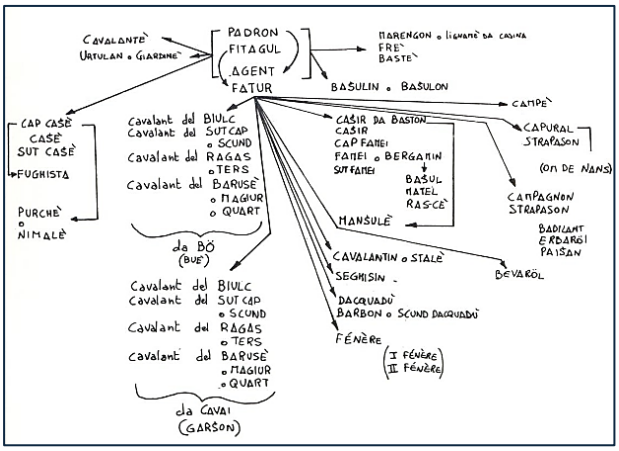

Figure 24 – Panoramic view of the exhibition space dedicated to "The Organisation of the Lodigiano Farmstead" (left) and diagram of the relative organisational chart.

An **organisational chart** illustrates how work was divided among the various labourers on the Lodigiano *cascina* (farmstead) at the height of its development, namely between the late 19th and early 20th century. What peasants called the *padròn* was not always the landowner but could also be his agent or the *fitàul*, that is, the tenant farmer who rented and managed the holding. The *cascina* functioned as a large enterprise, with different "sectors" (similar to departments in industry), each directed by a head: the *fatùr*, responsible for field work; the *casìr*, responsible for the cattle barn; and the *cap casé*, in charge of the dairy. Other figures, such as the domestic staff serving the *padròn*, did not fall into these categories. The workers were genuine wage labourers (comparable to industrial workers), paid in both money and kind (housing, supplies of grain etc.). Two sluice gates on display recall the central role of irrigation management, entrusted to the *dacquadù* (irrigator), the farm worker in charge of water distribution. Also on display are **three tools used for harvesting ice for storage in icehouses**: the *redìn* (net), the *màsa* (wooden mallet), and the *badìl* (shovel). In winter, artificial ponds were prepared in which water would freeze. The ice, broken up with the mallet and gathered with the long-handled net, was transported on sled carts to the *nevére* (icehouses). There it was carefully packed, often mixed with snow, to form a compact mass, then covered with straw or rice husks for insulation. The use of icehouses continued until the late 1940s.

THE CARTWRIGHT

Figure 25 – Panoramic view of the exhibition space "The Cartwright".

The **cartwright** (*marengon* or *lignamé da casina*) was, among all the artisanal figures connected with the agricultural world, the most distinctive. He was skilled in constructing carts in all their component parts, wooden agricultural implements, household furniture and furnishings, as well as toys for children. He often worked in collaboration with the blacksmith to build those tools in which metal was combined with wood as part of the structure.

In the large farmsteads, the cartwright was a salaried worker and resided on the farm, where he occupied a workshop called the *arsenale*, equipped with a workbench and his tools. At other times, he worked independently and maintained his own workshop in the village.

THE SADDLER AND THE BLACKSMITH-FARRIER

Figure 26 – Views of the exhibition spaces "The Saddler" (left) and "The Blacksmith-Farrier" (right).

As long as the age of animal traction lasted, a key figure was the **blacksmith-farrier** (*fré*). He was responsible for shoeing the hooves of draught animals (horses, oxen, mules) and for other tasks such as repairing the metal parts of ploughs and early mechanical implements, as well as repairing and constructing, in collaboration with the cartwright, carts and other agricultural vehicles. He too could be a wage labourer residing on the farmstead, or else an artisan with a modest workshop on the edge of the village or hamlet.
The **saddler** (*bastè*) was responsible for making harnesses for animal traction. He produced pack saddles, riding saddles, reins, collars, and everything required for the harnessing of horses or cattle. In all farmsteads, large and small, there was a saddlery, a place where all the equipment for the harnessing of animals was stored.

DIORAMA OF THE CASCINA OF THE LOWER LOMBARD PLAIN

Figure 27 – View of the diorama reconstructing in miniature a farmstead of the Lower Lombard Plain.

The model of the *cascina* of the *Bassa* (5 m × 4 m) was created by the well-known modeller Pier Luigi Bombelli of Sergnano (Cremona) and his team. Structurally, the model is highly representative of the *Bassa Lombarda (Lower Lombardy)*. Indeed, it displays syncretic features, as is often the case in areas situated at the centre of a ring of territories characterised by different building types. Thus, the dwelling on the right reflects the influence of the Bergamasque model. The central structure presents feature typical of the Cremasco style. The **cowshed**, on the other hand, clearly evokes the Lodigiano type. From right to left, one can observe: the **labourer's house** with the table laid (the calendar shows 25 December), the **bread oven, the tool shed beneath the hayloft, the manor house, the portico filled with equipment, pig processing, the cowshed, carts in the farmyard, domestic animals, the latrine, the well, the market gardener, and dozens of other objects**, both inside the buildings and in the open air.

THE DAIRY

Figure 28 – Panoramic view of the exhibition space "The Dairy".

Farm dairies were generally located next to the cattle barns, where the milk to be processed was produced, and near the pig sheds, where pigs were fed with the whey resulting from cheese-making. Among the rooms that composed the dairy was the **skimming room**, which housed round copper basins in which milk was left for 12 hours to allow the cream to rise, later removed with a skimming ladle (*spannarola*). By the 1930s–40s, these basins had been replaced by flat rectangular containers with an outlet at one end, enabling the skimmed milk to drain off first, followed by the cream. The cream was then poured into the churn along with a little ice. Once the churn was set in motion, the beaten cream turned into butter. The butter, once extracted and worked, was moulded into specific shapes. For the production of *grana* cheese, the skimmed milk was taken to the cooking room and poured, together with the whole milk from the night milking, into a special **copper cauldron** where the cheesemaking process began. Among the instruments on display is a large copper cauldron, bell-shaped and suspended by a strong handle from a rotating crane, used for making *grana* cheese. This type of direct-fire cauldron, in use since the Middle Ages, was replaced in the 20th century by steam cauldrons, capable of heating milk more evenly and precisely. From 100 litres of milk, 2 kg of butter, 8–10 kg of fresh *grana* cheese and 80-90 L of whey for pig feeding were obtained, which, after maturation, yielded 6.5–7.0 kg of aged cheese.

THE GREAT CEREAL CROPS: RICE, MAIZE AND WHEAT

Figure 29 – Panoramic views of the exhibition spaces dedicated to rice (left) and to wheat and maize (right).

These exhibition spaces display agricultural tools collected from Lodigiano farmsteads, used in all stages of the **cultivation of rice, wheat and maize**: from **soil preparation for sowing, to crop management, harvesting, and storage** of the product. Among the implements on display are ploughs, rollers, harrows, seed boxes, sickles, spades, weeding spades and hoes, levelling boards, threshing tools, sieves, forks and rakes for separating straw, and many others. Of particular historical importance is an animal-drawn thresher designed in 1852 by Count Gian Giacomo Bolognini, a significant example of early agricultural mechanisation. This tool, drawn across the farmyard, used comb-like working parts to crush ears of grain and release the kernels.

GRASSLAND FARMING AND THE BARN

Figure 30 – Two views of the exhibition spaces dedicated to grassland farming and the barn.

These spaces also feature farming tools collected from Lodigiano farmsteads, used for the **cultivation of meadows and for barn management**. For grassland farming, the displays include chain harrows, weeding spades, shovels, scythes, sickles, rakes, large hay rakes, whetstones and whetstone holders, anvils, and scythe hammers. For the barn: two wheelbarrows (one for grain, the other for manure), a manure stretcher, root cutters, stalk choppers, milking stools, calf muzzles, horse bits, harnesses, yokes and balancing rods. Of particular interest is a sheep pack-saddle from the Bergamo area, once used to carry the insignia of the owner: on entering the village, it was placed on the most beautiful sheep of the flock. Also displayed among the barn objects is a terracotta statuette of Saint Anthony Abbot, protector of domestic animals.

THE LABOURER'S HOUSE

Figure 31 – Two views of the exhibition space "The Labourer's House": the kitchen (left) and the bedroom (right).

This exhibition space recreates, in two separate rooms, the **kitchen and bedroom** of a typical labourer's dwelling, which was usually located within the farmstead. The display is set on a single floor, although in reality the kitchen was typically on the ground floor and the bedroom upstairs. The kitchen was the only heated room in the house, thanks to the presence of a fireplace. On display here, in addition to the essential furnishings—a table, some chairs, and two cupboards—are various everyday objects, including a wood-fired stove, pots and pans, crockery and cutlery, mousetraps, a *flit* sprayer (for DDT, used against flies, mosquitoes and cockroaches), and other utensils. The bedroom features a double bed with bedside tables, two cradles, a metal washstand with ceramic basin, and some peasant clothes and shoes. On the bed are three small braziers filled with embers covered in ash. Inserted into a special frame (*prete*), these were placed under the covers to provide the warmth needed to get into bed on freezing winter nights. Beside the bed is a **structure for silkworm rearing**, a source of income which, from the 15th to the early 19th century, was limited to the dry upper plain but later spread also to the lower plain, becoming an important resource for both landowners and labourers. Silkworms were fed exclusively on mulberry leaves, very rich in protein. Bedrooms used for silkworm rearing were whitewashed every year to combat the many diseases that threatened the silkworms.

For further information, visit www.mulsa.it and download the complete guide

https://www.mulsa.it/pubblicazioni-mulsa-editore

www.mulsa.it