seed drill

The seed drill is an essential tool in agriculture; indeed, its invention significantly improved **agricultural production** because:

- It reduces seed **wastage**
- It enables sowing in **neat rows**
- It allows for **weeding** between rows, improving weed management
- It increases crop **yields**

Seed drills were already in use in **Mesopotamia** and **China** as early as 2000 BC.
The first documented modern seed drill dates back to **1580** and was designed by **Taddeo Cavallini** of Bologna; it was later perfected by the English agronomist **Jethro Tull** in **1701**.

The **functional components** are: the hopper to hold the seed, a distribution system, the seed tubes, and the furrow-opening and covering mechanisms.

The seed drill **operates** by opening the furrow, distributing the seed evenly and covering it.

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Shuck corn

The shuck corn, also known as a ‘sgranamelga’ in the Piedmontese, Lombard and Venetian dialects, is a traditional agricultural tool **used to separate the corn kernels from the cob**. The kernels were then used to produce flour and animal feed.

It was widely used in the countryside of **northern Italy** until the mid-20th century, when threshing machines became widespread.

It consists of a wooden or iron **body**, a **hole** into which the cob is inserted, a toothed **roller** capable of detaching the kernels, and a **crank handle** to operate the mechanism.

The purpose of this tool was to **speed** up the work that would otherwise have had to be done by hand (often by women and children).

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Balance scale

The balance scale has **medieval** origins and is an evolution of the **Roman steelyard**; indeed, it shares the same principle.

In the balance scale, a system of **levers** connected to the platform transmits the weight of the object to a **graduated beam**, where **small weights** are moved until **equilibrium** is reached. This structure, known as a **balance** beam, allows very large loads to be weighed accurately thanks to the mechanical **multiplication** of force.

A traditional balance scale from the 19th/20th century consists of:

- **Platform**: where the load is placed.
- **Yoke**: the part that receives the force from the platform.
- **Internal lever system**: amplifies and transmits the force.
- **Graduated beam**: a bar with notches and numbers.
- **Sliding counterweight(s)**: small weights that move along the bar.
- **Pivot point**: the fixed point around which the system rotates.

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Balance scale with weighing pan

The balance is an ancient type of scale, of **Etruscan** and later **Roman** origin, consisting of:

- A **graduated beam** (stylus),
- A **fulcrum** (upper hook),
- A **sliding weight** known as a 'Roman weight'
- A **point for suspending** the load.

In the version with a pan, the object to be weighed is not hung from a **hook but placed on a metal pan fixed to the end of the short arm**.

The **operation** is identical to that of the classic balance:

1. The object is placed on the pan attached to the short arm of the lever.
2. The balance is lifted by the upper hook, which acts as a fulcrum.
3. The operator slides the weight along the graduated scale.
4. When the beam returns to a horizontal position, the weight of the load is balanced by the Roman weight.
5. The reading is taken directly from the scale engraved on the beam.

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Grain threshing machine

The grain separator is a machine used in wheat cleaning to remove foreign seeds (such as vetch) and other impurities by exploiting differences in the shape, size or roundness of the grains.

It is a typical piece of equipment in the milling industry of the 19th and 20th centuries.

There are three main types of grain separator:

- **Drum separator**: consisting of a hollow cylinder with the inner surface covered in calibrated cells
- **Disc separator**: consisting of horizontal perforated discs that rotate inside a vertical cylinder
- **Helical separator**: consisting of a sheet of metal wound in a spiral around a vertical tube

This machine was, and remains, important as it improves the **quality of the flour**, prevents toxic seeds from entering the product, allows for the classification of cereals and increases the **efficiency of the milling process**.

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Gear pulley

A pulley is a mechanical component used to **transmit rotational motion** between two shafts via a flexible element (belt, rope or chain).

In **water mills**, these pulleys were mounted on **shafts** that received the motion from the **water wheel**. They were often made of wood or cast iron and had different diameters to **adjust the speed**.

The water wheel sets a drive shaft in rotation.
From this shaft ran a system of gear wheels, pulleys and belts that distributed the motion to the various **internal machines**.

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Beetroot cutter

The beet cutter is a tool used to **slice fodder beets for cattle and pigs, or sugar beets, into thin strips**. This tool **greatly sped** up the work and made the beets more **digestible**.

It was extremely widespread between the late 19th and mid-20th centuries, particularly in the **irrigated areas of Piedmont** and the Po Valley.

The most common models featured:

- An **upper hopper** into which the beets were fed.
- A **rotating blade** or a **toothed drum**.
- A side **crank that** set the mechanism in motion.
- An **outlet** from which the strips fell.

The structure was made of wood and iron in the oldest models, and cast iron in those from the early 20th century.

Some models were **secured to a table** or a sideboard using a clamp; others were full-scale barn machines, larger and more stable.

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Cart

Horse-drawn carts are one of the most recognisable symbols of traditional agriculture: **simple**, **sturdy** and **versatile**. They evoke a world in which **animal power** was the main driving force behind all work in the fields.

They were two- or four-wheeled vehicles, made of **wood** and **iron**, designed to **transport agricultural materials**: hay, manure, grain, tools, seasonal crops, bundles of brushwood, stones, water.
Each region had its own models, but the principle was always the same: maximum capacity, minimum effort for the animal.

A typical agricultural **cart** from the 19th–20th centuries had:

- A hardwood **frame** (oak, ash, elm)
- Iron axles and metal rims on the **wheels**
- Fixed or folding side **panels**
- A **drawbar** for attaching to the horse
- **Lever brakes** on the more advanced models
- A **leaf spring** or **rudimentary suspension** on long-distance transport carts

The construction was the work of **cartwrights** and **blacksmiths**, often working in collaboration.

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Roller

The roller tells a fundamental part of the history of agriculture. It is **simple**, **heavy** and **basic**, and it is precisely for this reason that it has remained almost unchanged for centuries.

It was a towed implement (first by oxen and horses, then by tractors) consisting of:

- A heavy **cylinder** made of wood, stone, iron or cast iron
- A frame with a **drawbar** for attaching to the animal
- Sometimes two **rear handles** for better steering

Its purpose was to compact and level the soil after the main tillage operations. In particular, it was used to:

- **Breaking up** clods after ploughing
- **Preparing** the seedbed
- **Improving germination** by passing it over the seedbed after sowing
- Maintaining **permanent grassland**, as in spring the roller was used to re-settle roots lifted by frost, flatten uneven ground and ensure a uniform cut of the turf.

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Plough

The plough is the agricultural implement which, since **Neolithic** times, has been used to **cut**, **loosen** and **turn** the soil in preparation for **sowing**. It is one of the tools that has most transformed the history of agriculture.

The **key components** are:

- **Mouldboard**: a vertical blade that cuts through the soil
- **Ploughshare**: a horizontal blade that lifts the soil
- **Mouldboard**: a curved surface that turns the soil over
- **Frame**: the supporting structure
- **Drawbar**: for towing (by animal or machine)
- **Wheels (on heavy-duty models)**: to regulate depth and stability

Ploughing has specific and fundamental functions:

- **Turning** the soil to bring the most fertile layers to the surface
- **Working straw**, stubble and organic fertilisers into the soil
- **Removing weeds**
- **Breaking up** and aerating the soil
- **Preparing** the seedbed for subsequent cultivation

It is the foundation of traditional farming.

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Tine harrow

The tine harrow, also known as a *tigra*, is an agricultural implement used to **refine** and **level** the soil after ploughing. It consists of:

- A wooden or iron **frame**
- A series of **vertical metal tines**
- A **drawbar** for animal traction (horses, oxen)
- Sometimes a **weight bar** to increase penetration

It is one of the **oldest** and longest-serving tools in agricultural history.

The tine harrow is used to:

- **Break up** clods after ploughing
- **Level** the soil
- **Prepare the seedbed**
- **Bury** the seed
- Break up the **surface crust** after rain

It was a **versatile** tool, used almost all year round.

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Winnowing fan

The winnowing fan is a very ancient agricultural tool, used to **winnow grain** after threshing, separating the kernels from the **chaff**, **dust** and **plant debris**.

A manual winnowing fan was already in use in the grain farming of ancient Greece and ancient Rome; this consisted of a **paddle-type winnowing fan** (which had a large wooden paddle, was slightly concave in shape and was often used in open threshing floors, where the natural wind aided the separation) or a **basket-type winnowing fan**.

The mechanical winnower is a late **19th-century** evolution of the manual version. It was constructed with a wooden frame (later made of sheet metal), an internal fan, interchangeable sieves, a crank or belt, and multiple outlets for the various separated materials. The operation involves:

- Cereal fed in via a **hopper**
- Grains falling onto **vibrating sieves**
- A **fan** operated by hand, by pedal or by belt generates a jet of air that separates the lighter parts from the grains
- **Collection** of the separated products.

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Potato digger

The potato digger is a hand-operated or horse- and ox-drawn implement used to **lift the soil** beneath a row of potatoes so that the tubers emerge without being damaged. It originated in the mid-19th century.

The principle behind its operation was to lift the clod with a **gentle movement**, so that the soil opens up and the potatoes emerge to the surface. The operator guides the tool to avoid cutting the tubers, and the potatoes are then harvested by hand.

This was important because if the potatoes are cut or crushed, they rot.

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Foot-operated grinding wheel

The foot-powered grindstone is a tool consisting of an **abrasive stone** mounted on an axle, which is set in rotation by a pedal operated by the operator's foot.
It was used to **sharpen** blades and tools such as scythes, billhooks, hay knives, axes, forestry blades and stable tools.

The principle is simple:

1. The operator sits on a **stool** or on the **machine itself**.
2. They operate the **pedal** with a back-and-forth movement of the foot.
3. The pedal moves a connecting **rod** or a **belt** linked to the wheel's **axle**.
4. The **stone** begins to rotate.
5. The **blade** is placed on the stone, often moistened by a basin of water.

Water is essential because:

- It **cools** the blade
- It prevents **accidental hardening** (which would make it brittle)
- It **cleans** the abrasive surface

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