Engineer

Engineer

[](https://en.wikipedia.org/wiki/File:Grondplan_citadel_Lille.JPG)Engineers, as practitioners of [engineering](https://en.wikipedia.org/wiki/Engineering), are [professionals](https://en.wikipedia.org/wiki/Professional) who [invent](https://en.wikipedia.org/wiki/Invention), [design](https://en.wikipedia.org/wiki/Design), analyze, build and test [machines](https://en.wikipedia.org/wiki/Machine), [complex systems](https://en.wikipedia.org/wiki/Complex_system), [structures](https://en.wikipedia.org/wiki/Structure), [gadgets](https://en.wikipedia.org/wiki/Gadget) and [materials](https://en.wikipedia.org/wiki/Material) to fulfill functional objectives and requirements while considering the limitations imposed by practicality, regulation, safety and cost.[[1]](https://en.wikipedia.org/wiki/Engineer#cite_note-bls-1)[[2]](https://en.wikipedia.org/wiki/Engineer#cite_note-nspe-2) The word engineer ([Latin](https://en.wikipedia.org/wiki/Latin) ingeniator,[[3]](https://en.wikipedia.org/wiki/Engineer#cite_note-3) the origin of the Ir. in the title of engineer in countries like Belgium and The Netherlands) is derived from the Latin words ingeniare ("to contrive, devise") and ingenium ("cleverness").[[4]](https://en.wikipedia.org/wiki/Engineer#cite_note-4)[[5]](https://en.wikipedia.org/wiki/Engineer#cite_note-5) The foundational qualifications of a licensed professional engineer typically include a four-year [bachelor's degree in an engineering discipline](https://en.wikipedia.org/wiki/Bachelor_of_Engineering), or in some jurisdictions, a [master's degree in an engineering discipline](https://en.wikipedia.org/wiki/Master_of_Engineering) plus four to six years of peer-reviewed professional practice (culminating in a project report or thesis) and passage of engineering board examinations.

The work of engineers forms the link between [scientific discoveries](https://en.wikipedia.org/wiki/Discovery_(observation)) and their subsequent applications to human and business needs and quality of life.

History

Engineering has existed since ancient times, when [humans](https://en.wikipedia.org/wiki/Humans) devised inventions such as the wedge, lever, wheel and pulley, etc.

The term engineering is derived from the word engineer, which itself dates back to the 14th century when an engine'er (literally, one who builds or operates a [siege engine](https://en.wikipedia.org/wiki/Siege_engine)) referred to "a constructor of military engines".[[7]](https://en.wikipedia.org/wiki/Engineering#cite_note-7) In this context, now obsolete, an "engine" referred to a military machine, i.e., a mechanical contraption used in war (for example, a [catapult](https://en.wikipedia.org/wiki/Catapult)). Notable examples of the obsolete usage which have survived to the present day are military engineering corps, e.g., the [U.S. Army Corps of Engineers](https://en.wikipedia.org/wiki/United_States_Army_Corps_of_Engineers).

The word "engine" itself is of even older origin, ultimately deriving from the Latin ingenium (c. 1250), meaning "innate quality, especially mental power, hence a clever invention."[[8]](https://en.wikipedia.org/wiki/Engineering#cite_note-8)

Later, as the design of civilian structures, such as bridges and buildings, matured as a technical discipline, the term [civil engineering](https://en.wikipedia.org/wiki/Civil_engineering)[[6]](https://en.wikipedia.org/wiki/Engineering#cite_note-ECPD_Definition_on_Britannica-6) entered the lexicon as a way to distinguish between those specializing in the construction of such non-military projects and those involved in the discipline of [military engineering](https://en.wikipedia.org/wiki/Military_engineering).

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Definition

In 1961, the Conference of Engineering Societies of Western Europe and the United States of America defined "[professional engineer](https://en.wikipedia.org/wiki/Professional_engineer)" as follows:[[6]](https://en.wikipedia.org/wiki/Engineer" \l "cite_note-6)

### A professional engineer is competent by virtue of his/her fundamental education and training to apply the scientific method and outlook to the analysis and solution of engineering problems. He/she is able to assume personal responsibility for the development and application of engineering science and [knowledge](https://en.wikipedia.org/wiki/Knowledge), notably in research, design, construction, manufacturing, superintending, managing, and in the education of the engineer. His/her work is predominantly intellectual and varied and not of a routine mental or physical character. It requires the exercise of original thought and judgment and the ability to supervise the technical and administrative work of others. His/her education will have been such as to make him/her capable of closely and continuously following progress in his/her branch of engineering science by consulting newly published works on a worldwide basis, assimilating such [information](https://en.wikipedia.org/wiki/Information), and applying it independently. He/she is thus placed in a position to make contributions to the development of engineering science or its applications. His/her education and training will have been such that he/she will have acquired a broad and general appreciation of the engineering sciences as well as thorough insight into the special features of his/her own branch. In due time he/she will be able to give authoritative technical advice and assume responsibility for the direction of important tasks in his/her branch.

Types of engineers

Photograph of the Engineering group, sculpted by [John [](https://en.wikipedia.org/wiki/File:Albert_Memorial_-_Engineering_Group.jpg)Lawlor](https://en.wikipedia.org/wiki/John_Lawlor_(sculptor)), [Albert Memorial](https://en.wikipedia.org/wiki/Albert_Memorial)

There are many branches of engineering, each of which specializes in specific technologies and products. Typically, engineers will have deep knowledge in one area and basic knowledge in related areas. For example, mechanical engineering curricula typically include introductory courses in electrical engineering, computer science, materials science, metallurgy, mathematics, and software engineering.

An engineer may either be hired for a firm that requires engineers on a continuous basis, or may belong to an engineering firm that provides [engineering consulting](https://en.wikipedia.org/wiki/Engineering_consulting) services to other firms.

When developing a product, engineers typically work in interdisciplinary teams. For example, when building robots an engineering team will typically have at least three types of engineers. A mechanical engineer would design the body and actuators. An electrical engineer would design the power systems, sensors, electronics, embedded software in electronics, and control circuitry. Finally, a software engineer would develop the software that makes the robot behave properly. Engineers that aspire to management engage in further study in business administration, project management and organizational or business psychology. Often engineers move up the management hierarchy from managing projects, functional departments, divisions and eventually CEOs of a multi-national corporation.

1.Automobile Engineering 2. Electrical Engineering

3.Aerospace Engineering 4.Fire Protection Engineering

5.Agricultural Engineering 6. Industrial Engineering

7.Building Engineering 8.Software Engineering

9.Biomedical Engineering 10. Petroleum Engineering

11.Chemical Engineering 12.Mechanical Enginering

13.Civil Engineering 14. Nuclear Engineering

15.Computer engineering

[](https://en.wikipedia.org/wiki/File:Apollo_13_Mailbox_at_Mission_Control.jpg)

1.Aerospace Engineering

Aerospace engineering is the primary field of [engineering](https://en.wikipedia.org/wiki/Engineering) concerned with the development of [aircraft](https://en.wikipedia.org/wiki/Aircraft) and [spacecraft](https://en.wikipedia.org/wiki/Spacecraft).[[3]](https://en.wikipedia.org/wiki/Aerospace_engineering#cite_note-3) It has two major and overlapping branches: [aeronautical](https://en.wikipedia.org/wiki/Aeronautics) engineering and [astronautical](https://en.wikipedia.org/wiki/Astronautics" \o "Astronautics) engineering. [Avionics](https://en.wikipedia.org/wiki/Avionics) engineering is similar, but deals with the [electronics](https://en.wikipedia.org/wiki/Electronic_engineering) side of aerospace engineering.

"Aeronautical engineering" was the original term for the field. As flight technology advanced to include vehicles operating in [outer space](https://en.wikipedia.org/wiki/Outer_space), the broader term "[aerospace](https://en.wikipedia.org/wiki/Aerospace) engineering" has come into use.[[4]](https://en.wikipedia.org/wiki/Aerospace_engineering#cite_note-britannica_Engineering-4) Aerospace engineering, particularly the astronautics branch, is often colloquially referred to as "rocket science".

[](https://en.wikipedia.org/wiki/File:Umspannwerk-Pulverdingen_380kV-Trennschalter.jpg)2.Electrical Engineering

Electrical engineering is an [engineering](https://en.wikipedia.org/wiki/Engineering) discipline concerned with the study, design, and application of equipment, devices, and systems which use [electricity](https://en.wikipedia.org/wiki/Electricity), [electronics](https://en.wikipedia.org/wiki/Electronics), and [electromagnetism](https://en.wikipedia.org/wiki/Electromagnetism). It emerged as an identifiable occupation in the latter half of the 19th century after the [commercialization](https://en.wikipedia.org/wiki/Commercialization) of the [electric telegraph](https://en.wikipedia.org/wiki/Electric_telegraph), the telephone, and [electrical power](https://en.wikipedia.org/wiki/Electrical_power) generation, distribution, and use.

Electrical engineering is divided into a wide range of different fields, including [computer engineering](https://en.wikipedia.org/wiki/Computer_engineering), [systems engineering](https://en.wikipedia.org/wiki/Systems_engineering), [power engineering](https://en.wikipedia.org/wiki/Power_engineering), [telecommunications](https://en.wikipedia.org/wiki/Telecommunications), [radio-frequency engineering](https://en.wikipedia.org/wiki/Radio-frequency_engineering), [signal processing](https://en.wikipedia.org/wiki/Signal_processing), [instrumentation](https://en.wikipedia.org/wiki/Instrumentation), [photovoltaic cells](https://en.wikipedia.org/wiki/Photovoltaic_cell), [electronics](https://en.wikipedia.org/wiki/Electronics), and [optics](https://en.wikipedia.org/wiki/Optics) and [photonics](https://en.wikipedia.org/wiki/Photonics). Many of these disciplines overlap with other engineering branches, spanning a huge number of specializations including hardware engineering, [power electronics](https://en.wikipedia.org/wiki/Power_electronics), electromagnetics and waves, [microwave engineering](https://en.wikipedia.org/wiki/Microwave_engineering), [nanotechnology](https://en.wikipedia.org/wiki/Nanotechnology), [electrochemistry](https://en.wikipedia.org/wiki/Electrochemistry), renewable energies, mechatronics/control, and electrical materials science.[[a]](https://en.wikipedia.org/wiki/Electrical_engineering#cite_note-1)

Electrical engineers typically hold a [degree](https://en.wikipedia.org/wiki/Academic_degree) in electrical engineering, electronic or electrical and electronic engineering. Practicing engineers may have [professional certification](https://en.wikipedia.org/wiki/Professional_certification) and be members of a [professional body](https://en.wikipedia.org/wiki/Professional_body) or an international standards organization. These include the [International Electrotechnical Commission](https://en.wikipedia.org/wiki/International_Electrotechnical_Commission) (IEC), the [Institute of Electrical and Electronics Engineers](https://en.wikipedia.org/wiki/Institute_of_Electrical_and_Electronics_Engineers) (IEEE) and the [Institution of Engineering and Technology](https://en.wikipedia.org/wiki/Institution_of_Engineering_and_Technology) (IET, formerly the IEE).

Electrical engineers work in a very wide range of industries and the skills required are likewise variable. These range from [circuit theory](https://en.wikipedia.org/wiki/Circuit_theory) to the management skills of a [project manager](https://en.wikipedia.org/wiki/Project_manager). The tools and equipment that an individual engineer may need are similarly variable, ranging from a simple [voltmeter](https://en.wikipedia.org/wiki/Voltmeter) to sophisticated design and manufacturing software.

[](https://en.wikipedia.org/wiki/File:Selfridges_BIrmingham.jpg)3.Building Engineering

A building engineer is recognised as being expert in the use of [technology](https://en.wikipedia.org/wiki/Technology) for the [design](https://en.wikipedia.org/wiki/Design), [construction](https://en.wikipedia.org/wiki/Construction), assessment and maintenance of the [built environment](https://en.wikipedia.org/wiki/Built_environment).[[1]](https://en.wikipedia.org/wiki/Building_engineer#cite_note-1) Commercial Building [Engineers](https://en.wikipedia.org/wiki/Engineer) are concerned with the planning, design, [construction](https://en.wikipedia.org/wiki/Construction), operation, renovation, and maintenance of buildings, as well as with their impacts on the surrounding environment.[[](https://en.wikipedia.org/wiki/Building_engineer#cite_note-2)

4.Chemical Engineering

Chemical engineering is an [engineering](https://en.wikipedia.org/wiki/Engineering) field which deals with the study of operation and design of [chemical plants](https://en.wikipedia.org/wiki/Chemical_plant) as well as methods of improving production. Chemical engineers develop economical commercial processes to convert raw materials into useful products. Chemical engineering uses principles of [chemistry](https://en.wikipedia.org/wiki/Chemistry), [physics](https://en.wikipedia.org/wiki/Physics), [mathematics](https://en.wikipedia.org/wiki/Mathematics), [biology](https://en.wikipedia.org/wiki/Biology), and [economics](https://en.wikipedia.org/wiki/Economics) to efficiently use, produce, design, transport and transform energy and materials. The work of chemical engineers can range from the utilization of [nanotechnology](https://en.wikipedia.org/wiki/Nanotechnology) and [nanomaterials](https://en.wikipedia.org/wiki/Nanomaterials" \o "Nanomaterials) in the laboratory to large-scale industrial processes that convert chemicals, raw materials, living cells, microorganisms, and energy into useful forms and products. Chemical engineers are involved in many aspects of plant design and operation, including safety and hazard assessments, [process design](https://en.wikipedia.org/wiki/Process_engineering) and analysis, [modeling](https://en.wikipedia.org/wiki/Modeling_and_simulation), [control engineering](https://en.wikipedia.org/wiki/Control_engineering), [chemical reaction engineering](https://en.wikipedia.org/wiki/Chemical_reaction_engineering), [nuclear engineering](https://en.wikipedia.org/wiki/Nuclear_engineering), [biological engineering](https://en.wikipedia.org/wiki/Biological_engineering), construction specification, and operating instructions.

Chemical engineers typically hold a degree in Chemical Engineering or [Process Engineering](https://en.wikipedia.org/wiki/Process_engineering). Practicing engineers may have professional certification and be accredited members of a professional body. Such bodies include the [Institution of Chemical Engineers](https://en.wikipedia.org/wiki/Institution_of_Chemical_Engineers) (IChemE) or the [American Institute of Chemical Engineers](https://en.wikipedia.org/wiki/American_Institute_of_Chemical_Engineers) (AIChE). A degree in chemical engineering is directly linked with all of the other engineering disciplines, to various extents.

5.Nuclear Engineering

Nuclear engineering is the engineering discipline concerned with designing and applying systems that utilize the energy released by nuclear processes.[[1]](https://en.wikipedia.org/wiki/Nuclear_engineering#cite_note-1)[[2]](https://en.wikipedia.org/wiki/Nuclear_engineering#cite_note-2) The most prominent application of nuclear engineering is the generation of electricity. Worldwide, some 440 nuclear reactors in [32 countries](https://en.wikipedia.org/wiki/Nuclear_power_by_country) generate 10 percent of the world's energy through [nuclear fission](https://en.wikipedia.org/wiki/Nuclear_fission).[[3]](https://en.wikipedia.org/wiki/Nuclear_engineering#cite_note-WNA-3) In the future, it is expected that [nuclear fusion](https://en.wikipedia.org/wiki/Nuclear_fusion) will add another nuclear means of generating energy.[[4]](https://en.wikipedia.org/wiki/Nuclear_engineering#cite_note-4) Both reactions make use of the [nuclear binding energy](https://en.wikipedia.org/wiki/Nuclear_binding_energy) released when atomic [nucleons](https://en.wikipedia.org/wiki/Nucleon) are either separated (fission) or brought together (fusion). The energy available is given by the [binding energy curve](https://en.wikipedia.org/wiki/Nuclear_binding_energy#Nuclear_binding_energy_curve), and the amount generated is much greater than that generated through chemical reactions. Fission of 1 gram of uranium yields as much energy as burning 3 tons of coal or 600 gallons of fuel oil,[[5]](https://en.wikipedia.org/wiki/Nuclear_engineering" \l "cite_note-5) without adding carbon dioxide to the atmosphere.

[](https://en.wikipedia.org/wiki/File:TVA_engineers_monitoring_Tellico_Dam_model.jpg)6.Civil Engineering

Civil engineering is a [professional engineering](https://en.wikipedia.org/wiki/Regulation_and_licensure_in_engineering) discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including [public works](https://en.wikipedia.org/wiki/Public_works) such as roads, bridges, canals, dams, airports, [sewage systems](https://en.wikipedia.org/wiki/Sewage_system), pipelines, structural components of buildings, and railways.[[1]](https://en.wikipedia.org/wiki/Civil_engineering#cite_note-1)[[2]](https://en.wikipedia.org/wiki/Civil_engineering#cite_note-2)

[](https://en.wikipedia.org/wiki/File:Irrigation_canal_in_Pisac,_Peru_2019-10-16-1.jpg)Civil engineering is traditionally broken into a number of sub-disciplines. It is considered the second-oldest engineering discipline after [military engineering](https://en.wikipedia.org/wiki/Military_engineering),[[3]](https://en.wikipedia.org/wiki/Civil_engineering" \l "cite_note-CSCE-3) and it is defined to distinguish non-military engineering from military engineering.[[4]](https://en.wikipedia.org/wiki/Civil_engineering#cite_note-eb-4) Civil engineering can take place in the public sector from municipal [public works](https://en.wikipedia.org/wiki/Public_works) departments through to federal government agencies, and in the private sector from locally based firms to global [Fortune 500](https://en.wikipedia.org/wiki/Fortune_Global_500) companies.

7.Agricultural Engineering

Agricultural engineering, also known as agricultural and biosystems engineering, is the field of study and application of [engineering](https://en.wikipedia.org/wiki/Engineering) science and designs principles for [agriculture](https://en.wikipedia.org/wiki/Agriculture) purposes, combining the various disciplines of [mechanical](https://en.wikipedia.org/wiki/Mechanical_engineering), [civil](https://en.wikipedia.org/wiki/Civil_engineering), [electrical](https://en.wikipedia.org/wiki/Electrical_engineering), [food science](https://en.wikipedia.org/wiki/Food_science), [environmental](https://en.wikipedia.org/wiki/Environmental_engineering), [software](https://en.wikipedia.org/wiki/Software_engineering), and [chemical engineering](https://en.wikipedia.org/wiki/Chemical_engineering) to improve the efficiency of [farms](https://en.wikipedia.org/wiki/Farm) and [agribusiness enterprises](https://en.wikipedia.org/wiki/Agribusiness)[[1]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-:0-1) as well as to ensure sustainability of natural and renewable resources.[[2]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-2)

An agricultural engineer is an [engineer](https://en.wikipedia.org/wiki/Engineer) with an [agriculture](https://en.wikipedia.org/wiki/Agriculturist) background. Agricultural engineers make the engineering designs and plans in an agricultural project, usually in partnership with an [agriculturist](https://en.wikipedia.org/wiki/Agriculturist) who is more proficient in [farming](https://en.wikipedia.org/wiki/Agriculture) and [agricultural science](https://en.wikipedia.org/wiki/Agricultural_science).

## History

[](https://en.wikipedia.org/wiki/File:Old_Style_Harvester.jpg)The first use of agricultural engineering was the introduction of [irrigation](https://en.wikipedia.org/wiki/Irrigation) in large scale agriculture in the [Nile](https://en.wikipedia.org/wiki/Nile) and the [Euphrates](https://en.wikipedia.org/wiki/Euphrates) rivers before 2000 B.C. Large irrigation structures were also present in [Baluchistan](https://en.wikipedia.org/wiki/Baluchistan) and [India](https://en.wikipedia.org/wiki/India) before [Christian era](https://en.wikipedia.org/wiki/Christian_era). In other parts of Asia, agricultural engineering was heavily present in [China](https://en.wikipedia.org/wiki/China). In South America irrigation was practiced in [Peru](https://en.wikipedia.org/wiki/Peru) by the [Incas](https://en.wikipedia.org/wiki/Incas) and in North America by the [Aztecs](https://en.wikipedia.org/wiki/Aztecs).[[3]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Davidson-3)

The Last Furrow by [Henry Herbert La Thangue](https://en.wikipedia.org/wiki/Henry_Herbert_La_Thangue)

The earliest plough was the [ard](https://en.wikipedia.org/wiki/Ard_(plough)" \o "Ard (plough)) or scratch-plough.[[4]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-4)

Settlers practiced irrigation in the vicinity of [San Antonio](https://en.wikipedia.org/wiki/San_Antonio) in 1715, the [Mormons](https://en.wikipedia.org/wiki/Mormons) practiced irrigation in [Salt Lake Valley](https://en.wikipedia.org/wiki/Salt_Lake_Valley) in 1847.[[3]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Davidson-3)

With growing [mechanization](https://en.wikipedia.org/wiki/Mechanization) and [steam power](https://en.wikipedia.org/wiki/Steam_power) in the [industrial revolution](https://en.wikipedia.org/wiki/Industrial_revolution), a new age in agricultural engineering began. Over the course of the industrial revolution, [mechanical harvesters](https://en.wikipedia.org/wiki/Mechanical_harvester) and [planters](https://en.wikipedia.org/wiki/Planter_(farm_implement)) would replace field hands in most of the food and [cash crop](https://en.wikipedia.org/wiki/Cash_crop) industries. [Mechanical threshing](https://en.wikipedia.org/wiki/Threshing#Mechanization) was introduced in 1761 by John Lloyd, Magnus Strindberg and Dietrich. Beater bar [threshing](https://en.wikipedia.org/wiki/Threshing) machine was built by [Andrew Meikle](https://en.wikipedia.org/wiki/Andrew_Meikle) in 1786.[[5]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Klaus-5) A [cast iron](https://en.wikipedia.org/wiki/Cast_iron) [plow](https://en.wikipedia.org/wiki/Plow) was first made by [Charles Newbold](https://en.wikipedia.org/wiki/Charles_Newbold) between 1790 and 1796.[[3]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Davidson-3)

Old Style Sunshine Harvester found in [Henty (wine)](https://en.wikipedia.org/wiki/Henty_(wine)" \o "Henty (wine)) region of NSW Australia

[James Smith](https://en.wikipedia.org/wiki/James_Smith_(inventor)) constructed a [mower](https://en.wikipedia.org/wiki/Mower) in 1811. [George Berry](https://en.wikipedia.org/w/index.php?title=George_Stockton_Berry&action=edit&redlink=1) used a steam [combine harvester](https://en.wikipedia.org/wiki/Combine_harvester) in 1886.[[5]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Klaus-5) [John Deere](https://en.wikipedia.org/wiki/John_Deere_(inventor)) made his first [steel plow](https://en.wikipedia.org/wiki/Steel_plow) in 1833. The two horse [cultivator](https://en.wikipedia.org/wiki/Cultivator) was first about 1861.[[3]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Davidson-3)

Fork hay tedder

The introduction of these engineering concepts into the field of agriculture allowed for an enormous boost in the productivity of crops, dubbed a "[second agricultural revolution](https://en.wikipedia.org/wiki/Second_agricultural_revolution)" which consisted of:[[6]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-6)

1. Shift from peasant subsistence-farming to cash-farming for the market
2. Technical changes of [crop rotations](https://en.wikipedia.org/wiki/Crop_rotation) and livestock improvement
3. Labour being replaced by machinery

A cultivator pulled by a tractor in [Canada](https://en.wikipedia.org/wiki/Canada) in 1943

In the 20th century, with the rise in reliable engines in airplanes, [cropdusters](https://en.wikipedia.org/wiki/Cropduster" \o "Cropduster) were implemented to disperse pesticides. [Benjamin Holt](https://en.wikipedia.org/wiki/Benjamin_Holt) built a combine harvester powered by [petrol](https://en.wikipedia.org/wiki/Petrol) in 1911. [Erwin Peucker](https://en.wikipedia.org/w/index.php?title=Erwin_Peucker&action=edit&redlink=1) constructed [bulldog tractors](https://en.wikipedia.org/wiki/Lanz_Bulldog) 1936. [Deutz-Fahr](https://en.wikipedia.org/wiki/Deutz-Fahr" \o "Deutz-Fahr) produced the rotary [hay tedder](https://en.wikipedia.org/wiki/Hay_tedder) in 1961.[[5]](https://en.wikipedia.org/wiki/Agricultural_engineering#cite_note-Klaus-5)

In the late 20th century, [genetically modified foods](https://en.wikipedia.org/wiki/Genetically_modified_food) (GMOs) were created, giving another large boost to crop yields and resistance to pests.