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Milestones in Agricultural Engineering

Since 1987, this section has featured technological innovations that changed the farming scene when they were introduced and which also led to considerable progress. If one follows the milestones of farm mechanization development 25, 50, and 75 years ago or even further back into the past, it is astonishing to discover that many ideas and suggested solutions nowadays are not, after all, as new as they may seem.

Last, but not least, this applies to the insight that innovative approaches need the greatest possible freedom for their development. If, however, restriction and bureaucracy are predominant, any kind of creativity, which is the most important motor of progress, cannot thrive.

1807

Exactly 200 years ago, Prussian statesman Freiherr vom Stein recognized this. The “Decree Regarding the Facilitated Possession of Property and the Personal Status of Rural Dwellers”, which was enacted by him on 9th October 1807, marks the beginning of the emancipation of peasants in Germany and released forces in rural areas which continue to act until the present. From that time on, every farmer was allowed to do on his grounds what he deemed right - a maxim which the entrepreneurial farmer of the 21st century also claims for himself. This allowed Germany to catch up with a development which had begun in England and had enabled this country to assume the leading role in industrialization. On the British islands, innovators were held in high esteem since the 18th century and were not considered a danger for the status quo. One of those who experienced this was Robert Salmon of Woburn, the estate manager of the Duke of Bedford. The hand mowing machine designed by him attracted positive attention, and rightfully so, as we know today. Its innovative character was based less on the scissor principle realized in this machine, but rather on the automatic depositing system, which consisted of oscillating rakes, as well as the disengaging device activated during reverse motion, and the variability of stubble height. These are all features which have become constituting elements of modern harvesting machines.

1832

175 years ago, the time of John Heathcoat and Josiah Parkes had come. One of them was a textile manufacturer and represented Tiverton in Parliament, and the other one was an engineer. Together, they received a patent for their steam plough, which was probably the first one in history. Their construction consisted of a wagon with a low platform from which a mounted 2-cylinder steam engine drove the vehicle itself and two cable winches. The plough was attached to the two cable winches, which worked at right angles to the direction of travel, and had to be drawn back and forth between the machine and the anchor winches positioned at the field's edge. This technique was not simple because the machine wagon and the anchor winches had to be moved after each furrow. However, this did not deter the two innovators. Since they were aware of the troubles of every beginning, they kept experimenting and were able to use the ploughing device the following year.

1857

150 years ago, Rudolf Sack, Loeben, received the order from Ukrainian estate owner Count Bobrinsky to supply 120 ploughs at

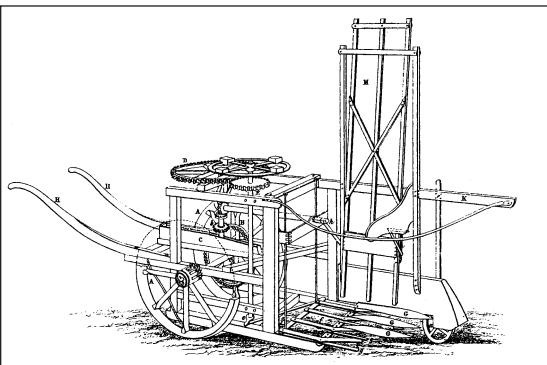


Fig. 1: Hand mowing machine by Robert Salmon, Woburn, 1807

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Fig. 2: Deutz automobile plough in field operation 1907



once. Since his own capacities were insufficient, he commissioned the British company Garrett & Sons to manufacture the ploughs in time and in good quality. At the same time, Sack acquired the first British patent for his ploughs and thus laid the foundation for the good reputation of his company, which persisted for many decades. Conversely, agricultural machinery manufacturers Dr. Schneitler & Andree in Berlin imported Hanson's and Coleman's potato spinner to Germany. After it had been redesigned by Dr. Schneitler, it became the precursor of all potato spinners produced in Germany. In 1857, agricultural machinery as a whole gained in importance. Successful foundations of new companies, such as the plough factory Schütz & Bethke, Lippehne, J. A. Lanvermeyer, Melle, Hugo Heber, Oberessendorf, Maschinenbau-Gesellschaft Heilbronn or Hofherr-Schranz, Vienna, prove the attractiveness of agricultural machinery construction for company founders.

1882

125 years ago, the German Statistical Office published the first Germany-wide statistics about the use of agricultural machines. Farmers were asked whether they had used agricultural machinery at least once during the year, but they were not asked to indicate the number of machines. Even given the limited scope of this question, the degree of mechanization was modest enough. Not even 8 % of all farms had used the agricultural machinery registered in the statistics. Relatively speaking, threshing gins were most widely used. One of those who noticed the backup in this field was Heinrich Lanz, Mannheim. His company immediately began to deliver steam peg drum threshers, which marked the beginning of a new era of threshing. Among the newly founded companies were Epple & Buxbaum, Augsburg, and A. Ventzki, Graudenz. Both companies quickly counted among large manufacturers in the industry.

1907

Exactly 100 years ago, a DLG touring exhibition was held for the first and only time in Düsseldorf. This exhibition was very interesting because Gasmotorenfabrik Deutz showed the Deutz plough locomotive, a 40 hp motor tractor. All-wheel drive, all-wheel steering, multiple-share ploughs mounted in the front and in the rear, which were able to be lifted by cables, were the characteristics of the tractor developed by engineer Joh. Brey. Together with the 25 hp Deutz automobile plough, a 2.80 m long tractor with a combustion engine, which weighed 3 t and



Fig. 3: Fendt tool-carrier F 12 GT

was also presented for the first time 100 years ago, it stands at the beginning of German tractor construction. The same year, Professor Alwin Nachtweh, Hanover, also broke new ground. With the VIMPA communications edited by him and published by Parey, the scientific literature of German agricultural engineering gained international reputation. During this time, agricultural engineering in general was taking shape at the international level. With the foundation of the ASAE, agricultural engineers in the USA formed their organization and thus made their contribution towards the 20th century as the century of agricultural mechanization.

1932

75 years ago, design engineers focused on baler construction. Claas, Harsewinkel, received a patent for a medium pressure baler with swinging pistons and automatic yarn binding. Welger, Wolfenbüttel, also introduced the swinging piston in their straw balers. The first agricultural trailer out of steel with air-rubber tyres built according to plans of the Deula (German School of Agronomy) promised new perspectives. In the USA, IHC presented the all-purpose tractor F 12, which found numerous friends worldwide thanks to the PTO and adjustable track width. 1st June of this year also remains unforgotten. On the occasion of the DLG touring exhibition, the "Max Eyth Society for the Promotion of Agricultural Engineering" was founded in Mannheim by members of the dissolving VIMPA. From this time on, this new organization provided a common platform for agricultural engineers.

1957

50 years ago, the Unimog made its debut as the "first agricultural tractor of the world" equipped with a synchronized transmission. Thus, an old wish of farmers was fulfilled, and gradually all tractor manufacturers adopted this new feature. Fendt showed that good things are sometimes a long time in the making. This company had waited longer than others until it produced its implement carrier in series. Then, however, the F 12 GT

left the assembly line and became the "ancestor" of an entire implement carrier family. B. Strautmann & Söhne, Laer, were also able to provide new impulses. The "Streublitz" combined a stall manure spreader with a loader, which meant significant progress in the mechanization of the manure chain. At the same time, international competitors stimulated agricultural engineering. In Pori, Finland, Sampo Rosenlew began to build combines, and the Douglas brothers along with Maurice Steiger started the production of large tractors beyond the 200 hp class in the USA. However, it was also necessary to part with some beloved traditions. After having manufactured more than 36,000 technically interesting tractors, Normag quit tractor production. In addition, the DLG and industry decided to hold their touring exhibitions only once every two years, which was intended to save resources and costs.

1982

In West Germany, the era of Mr. Ertl, then Federal Minister of Food, ended with the coalition of the social democrats and the liberals. His negotiations at the European level had made him popular among farmers, whose operations had an average size of 15.7 ha and who still advocated the model of the family farm. Meanwhile, this is history, which cannot be said about the topics of agricultural engineering. All of these topics, such as the reduction of soil erosion, alternative fuels, biogas, or the computerization of agriculture, are a response to current demands. However, there were also some technical treats in details. The axle series 300 from ZF, for example, provided a steering angle of 50 degrees. Schlüter, Freising, caused surprise with the hydraulically tipping "Super-Silent cab", and Daimler-Benz approached the 100 hp mark with its MB trac 1000. Before, 100 hp had been considered the limit for system vehicles. Finally, Belarus debuted on the German market. At the 57th DLG exhibition in Munich, the Russian manufacturer presented itself in western Germany for the first time after the focus had previously been on the agricultural sector of former East Germany as a purchaser of agricultural tractors.