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Milestones in agricultural engineering

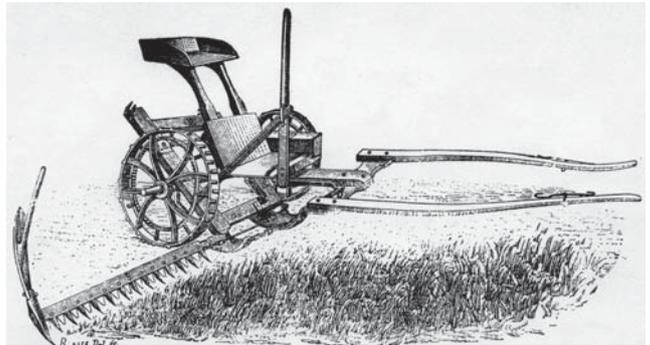
Presented here for over 20 years now have been agricultural engineering innovations that, in their time, changed the face of farming or at least advanced its progress a good deal. But a closer look at the telling developments in mechanisation 25, 50, 75 years ago, and even further back, often reveals the surprising fact that many ideas and solution suggestions are by no means as new as they at first might seem.

Advances in agricultural engineering have never been respecters of national borders. Innovations conceived today in one country will tomorrow be taken-up in another land and exploited in great style. Neither is it unknown for inventions to appear almost simultaneously and independently of each other in two different countries. In such cases the question who was “first” has to remain unanswered. But in the end it’s practical suitability that decides on acceptance. Sometimes the concept is right on target. In other cases, and for often incomprehensible reasons, acceptance never comes.

1784

Scotland was a tower of agricultural engineering advances 225 years ago when Arthur Young published for the first time his “Annals of Agriculture” in Edinburgh, probably the first specialist farming magazine. From the very beginning this journal was open to farming mechanisation questions. Arthur Young encouraged creative minds through his periodical to develop farm equipment innovations. Among the personalities he motivated in this way was Capel Lloft from Bury St. Edmunds. His mower applied a metal comb to separate grain ears from their stalks, a solution that had already been developed in antique times by the Gauls. The Scot James Watt also de-

Fig. 1



A grass mower from Walter A. Wood (1859). The design became trend-setting because the cutterbar offered very little resistance so that grass stalks could be cleanly cut.

Keywords

Mechanisation of agriculture, important inventions and events

Abstract

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serves a mention. On April 28, 1784 he patented his “Watt’s Parallelogram” through which the double-action steam engine achieved practical acceptance.

1809

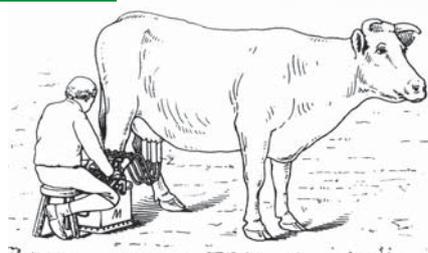
The great moment for Albrecht Daniel Thaer from Möglin struck 200 years ago. This was when the first volume of his four volume magnum opus “Grundsätze der rationellen Landwirtschaft” (Fundamentals of rational agriculture) was published and ran to several editions in rapid succession. Above all, however, this work revolutionised agricultural thinking. Never before had it been so clearly formulated that “the function of agricultural production” was “to achieve the highest possible profit”. At

another point it was emphasised: “For the farmer the art of correctly calculating is just as important as the skill of sowing.” Thaer’s plea for the introduction of capitalistic business methods emphatically included the application of modern agricultural technology and has lost nothing in its topicality nowadays.

1834

175 years ago estate owner Alsen constructed the “Drews Plough” at Drewshof near Elbing. This was an implement with a two-piece swingeltree that could be used for ploughing but also

Fig. 2



100 years ago Karl Bergner presented his Revalo milking machine, available as hand cranked as well as machine driven model.

for earthing-up potato drills or grubbing. For the different jobs the appropriate shares or tines were exchanged – just as was done later with universal ploughs. But Alsen's invention was well before its time and distribution of the implement remained limited to a part of West Prussia. More success was achieved by the English constructor Gardener. His turnip cutter was awarded the first English patent for such a machine and went on to become the prototype for many further root cutters.

1859

The American Walter A. Wood from Hoosick Falls, New York presented 150 years ago a team-pulled grass mower that became a trend setter. Before that, Wood had successfully built grain reapers but now he managed to develop a practically applicable mowing system that was able to give a clean cut because the grass offered hardly any resistance to the cutterbar progress through the crop. But it was mainly cultivations that German agricultural engineering occupied itself with. The Eberhardt Brothers from Ulm introduced their first plough completely made from

Fig. 3



The "Super X" test tractor developed by Porsche featured a stepless hydrostatic transmission.

iron and H.F. Eckert from Berlin surprised farmers with a multi-share plough that could be applied as a swing plough after removal of the bogey. However an extra special mark of progress was celebrated in Mannheim when the 21-year-old Heinrich Lanz started working in his father's freight and trading company and founded: "A company for the distribution of improved agricul-

tural machinery". His partner was Messrs Schwann & Co. in London which "Carried out the export of English machinery exclusively from the most renowned machinery factories in the country." The foundation stone was thereby laid for the later Heinrich Lanz AG that was to establish itself over decades as Europe's largest agricultural machinery manufacturer.

1884

125 years ago Andreas Heucke, Gatersleben achieved a premier. He'd been specialising in the repair of English steam engines and then went ahead with the manufacture of his own design. His steam plough locomotives proved themselves to be of highest quality and advanced to become ambassadors for high performance German agricultural engineering. From the seven officially (TÜV) certificated steam plough locomotives existing in Germany in 2009, four are of Heucke manufacture,

which says a lot for the robustness of Heucke production. Rud. Sack, Leipzig introduced for the first time parts identification through letters and numbers. This meant that the spare parts sector was then in the position to enable rapid supply of required products. The founding of new agricultural engineering firms confirmed the pioneer spirit in the sector at this time with Franz Eisele & Sohn, Laiz or Theodor Hey, Roitsch enriching the sector from then on with pumps and a wide range of farm implements.

1909

Gustav and Franz Welger, Wolfenbüttel presented the first patented German fully automatic self-binding straw baler. New introductions were also on show at the DLG exhibition in Leipzig where Karl Bergner from Bergedorf introduced his Revalo milking machine that could be delivered with a hand crank as well as motor drive. The Hamburg-based Pfaffe Brothers' stand offered yet another premier in Germany: the Köszei power cultivator that was later built under licence by Lanz, Mannheim. And then there was also Konrad von Meyenburg – an untiring inventor who opened new perspectives for non-inversion cultivation with his exchangeable cultivator blades patented 100 years ago.

1934

Under the direction of the Reich Minister for Food and Agriculture the German Agricultural Society (DLG) was inducted into the state agriculture and food production organisation (RNST) on January 15, 1934 with the organisation staging the first RNST exhibition in Erfurt. While the general politicisation continued apace, the organisation had difficulties in addressing agricultural engineering. But in the first course for farm equipment constructors held by Professor Kloth in January 1934 the only subject was agricultural engineering progress and, as in the past, this only took place outside the party offices. Thus

Fig. 4



Horsch started into farm equipment manufacture (1984) with large three-wheeled self-propelled machinery.

William Grams from Sydowwiese developed the Grams LKS 75 years ago, a self-propelled tool carrier which set the standard for all following tool carriers. Also exhibiting innovation power were the Claas brothers from Harsewinkel who brought the straw and hay harvest technology a huge step forward with their pto driven pick-up baler. But dominating everything 75 years ago was the stiff competition around pneumatic rubber tyres for tractors. Dr Könnecke, Continental-Hannover, Dr. Ehlers, Lanz-Mannheim und Dr. Preuschen pushed forward the development of a tractor pneumatic tyre with a wavy profile which exceeded the quality of North American tyres. The first serially produced Lanz Bulldog tractor with these tyres started work in 1934 on the Langen-Steinkeller owned Wildenow Estate, Neumark.

1959

On January 1, 1959 the Treaty of Rome was implemented and the European Economic Community became a reality. In Frankfurt/Main the 45th DLG exhibition presented 1090 exhibitors including 47 from abroad. Massey-Ferguson took over the British Standard Motor Company and achieved a year's output of 125,000 tractors. At the same time MF purchased a majority holding in the engine manufacturer Perkins, Peterborough and so expanded its position as the world's largest tractor makers. In German agricultural engineering the talk was about automatic transmissions. The prototype tractor "Super X" from Porsche featured an infinitely variable hydrostatic transmission and attracted the limelight at farm shows. That the mechanisation of the potato harvest still offered great potential was shown by Heinrich Kuxmann. His single-row oscillating sieve elevator with two adjacent grids horizontal to direction of travel delivering the lifted potatoes back on the ground to the side has been appreciated by potato growers for 50 years.

1984

The 58th DLG exhibition took place in Frankfurt/M. Opened by Federal Chancellor Helmut Kohl; the exhibits heralded the move into the age of electronic data processing. The possibilities opened-up by PC, BTX and growing number of user programmes were fascinating. Electronics were also advancing in the tractor world. For the first time Fendt built into its Farmer and Favorit tractors the "Fendt-Tronic" behind which lay an electro-hydraulic 3-point hitch with load sensor bolts as well as digital instrumentation for engine and pto rpm and travelling speed. Krone from Spelle reacted to the growing maize boom with development of an innovative forage maize harvester for 3-point mounting with row-independent cutting. New machinery producers brought extra dynamism into the farm equipment world: On the Sitzenhof Estate the Bavarian Schwandorf farming family Horsch founded Horsch-Maschinen GmbH which has set the trend for the past quarter century with large-scale self-propelled machinery and innovative crop establishment concepts.