

75 Conferences on Agricultural Engineering – a Great Period of Innovations

Highlights of a Success Story

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Abstract

The first periodic German conference on agricultural engineering took place in 1934 in Berlin, directed by *Prof. W. Kloth*. Basic data of all 75 conferences are listed in two tables. The war forced an interruption with a renewal at FAL Braunschweig by *Kloth* in 1951. VDI Branch of Agricultural Engineering became engaged from 1962 and included MEG from 1983. In 1990, the 48th conference was organized in Berlin jointly with EurAgEng testing a new European format. A change of the location in the uneven years to Hannover (ahead of Agritechnica) and the merger with AgEng conferences in 2007 completed a remarkable success story.

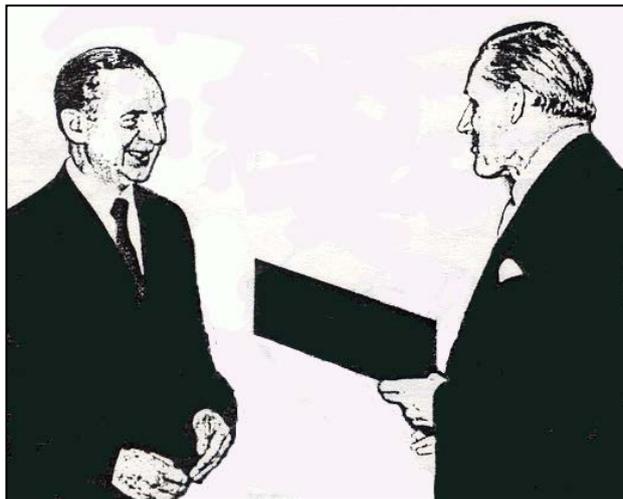


Figure 1: *Willi Kloth* 65 (1956), at left, congratulated by *Theodor Stroppel* [3]

1. Conference foundation and its first phase under Kloth and Stroppel

Highlights of the conference prehistory are, for example, outlined in reviews of *A. Stroppel* [1] and *H. J. Matthies* [2].

The first periodic German conference on agricultural engineering took place in Berlin, Jan. 30 - Febr. 1, 1934.

The driving force was *Dr.-Ing. Willi Kloth* (1891-1967), supported by his *Chief Engineer Theodor Stroppel* (1901-1981).

Kloth was at that time Founder and Head

Table 1: The first 22 conferences, most chaired by W. Kloth [4], supported by Th. Stroppel [5, 6]

No. / Year	Location	Chairman	Organizer	Chair VDI Section
1 - 8*) 1934-1941	Berlin	Kloth	Inst. of Agric. Machinery Techn. Hochschule Berlin	-
9-17/1951-59 18-22/1960-64	Braunschweig	Kloth Batel	Inst. of Agric. Engineering Fundamentals at FAL	1958-59: Kloth 1960-61: Friedrich 1962-64: Segler

*) paper documented for No. 1-5 by RKTL brochures No. 56, 61, 71, 88 and 91

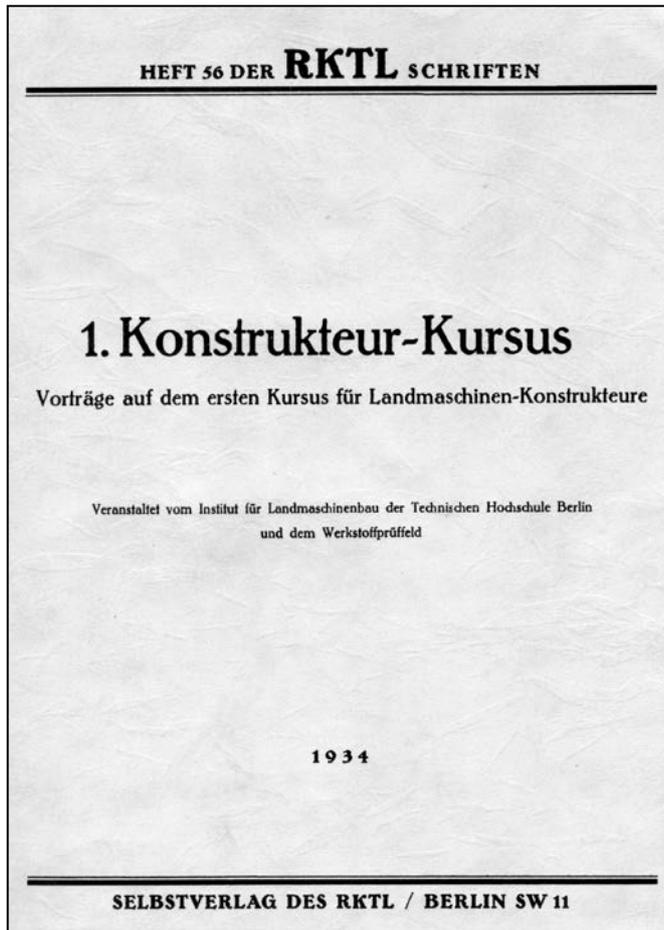


Figure 2: Documentation of the first conference

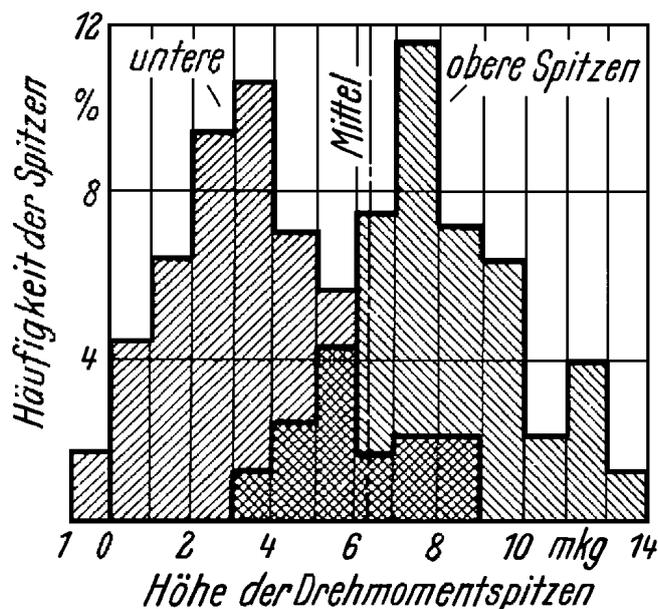


Figure 3: First load spectrum in engineering [9], histogram of PTO torque load peaks of a binder

of the Institute of Agricultural Machinery at Technical University Berlin [4] with affiliated RKTL Material Test Institute. His basic idea was to create a new link between research institutions and manufacturers of agricultural machinery for an efficient use of research results, for improved co-operations and critical discussions as well.

Several companies expressed initially their concerns fearing loss in advanced knowledge but this did not happen as stated in a review of *Kloth* in 1952 [7].

The content of the first five conferences was published by RKTL [8], **Fig. 2**.

The importance may be recognized by three papers, a first from *Kloth*, addressing the historical publication of the worldwide first load spectra, **Fig. 3**, by *Kloth* and *Stroppel* [9]. They had measured torque loads in the PTO drive line from the tractor to a binder at 550 rpm, processing them statistically to load spectra.

Kloth was recognizing the potential of lightweight design pointing out so early the need of statistic load analysis for fatigue modelling, wear forecasting and safety clutch settings. We can call him one of the world-wide first pioneers of this discipline [4].

Dr. Kloth (Prof. from 1940 [4]) directed not only the first phase of the conferences 1934-1941 in Berlin but also

a relaunch 1951-1959 in Braunschweig. The Federal Research Institute of Agriculture (FAL) was founded in 1948 at Braunschweig-Völkenrode and appointed him as Full Professor and Head of Institute of Agricultural Engineering Fundamentals (1948-1958).

Table 2 is listing the subjects and the authors of the 1951 meeting.

Kloth received an honorary PhD from HU Berlin 1956 and many other outstanding awards. *Prof. Batel* as his successor took over the chairmanship for the conferences from 1960 until 1964.

Table 2: The first conference after the war 1951

Subject	Speaker/author
Design in Germany and USA	W. Kloth
Tractor and implement in USA	H. Meyer
Forces at a plow body	G. Getzlaff
Tractor-implement forces	H. Skalweit
Implement lift kinematics	K. Hain
Hydraulic three point lift design	A. Seifert
Stiffness of frames	W. Bergmann
Design of spoke wheels	H. Müller
Design of soft crosspoints	W. Bergmann
Model use for design	W.G. Brenner
Static similarity fundamentals	W. Bergmann
Fundamentals of soil mechanics	W. Söhne
Aerodynamics for agric. machinery	U. Blenk
Pneumatic conveying design	G. Segler
Review on disc plows	W. Söhne

Papers were documented in GRUNDLAGEN DER LANDTECHNIK (1951-90), perfectly reviewed by its first chief editor *Theodor Stoppel*. As a second example I would like to show an extract of a publication on the design of frames, **Fig. 4**, [10]. The often underestimated increase of torsion stiffness by replacing open cross profiles by closed ones was demonstrated by *W. Bergmann*, the stiffness increased in this case 30 times ! I could use these fundamentals well for my lectures and for several consultations!

A third impressive example of a basic publication was a paper of *Walter Söhne*, first-time presenting his famous pressure bulbs under tires. He demonstrated already in 1951 the

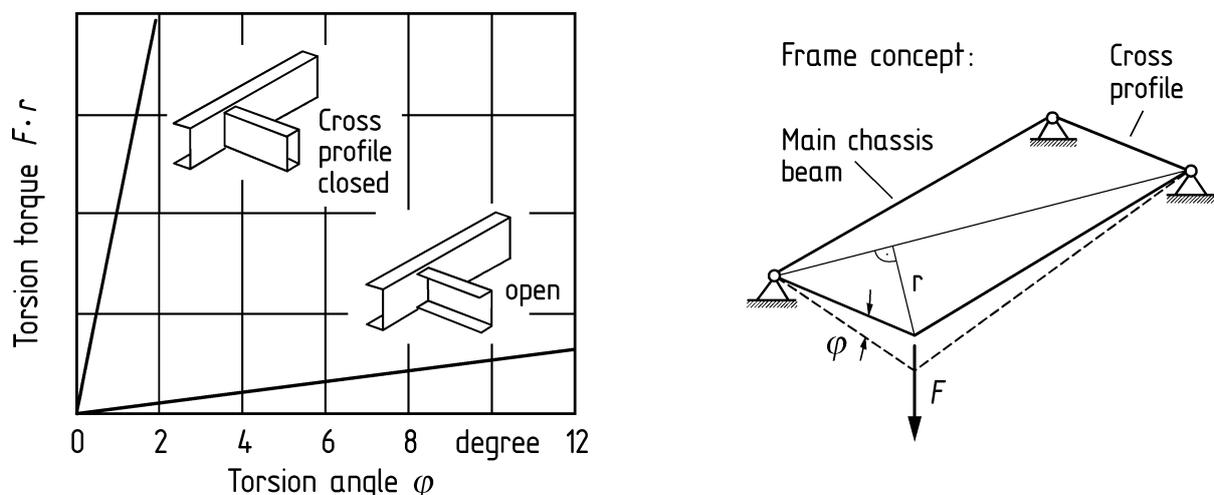


Figure 4: Influence of cross profiles on frame stiffness. Closed cross profiles instead of open ones increase torsion stiffness dramatically, diagram reproduced from [10]

important influence of tire loads on the soil pressures in the deeper layers, **Fig. 5**.

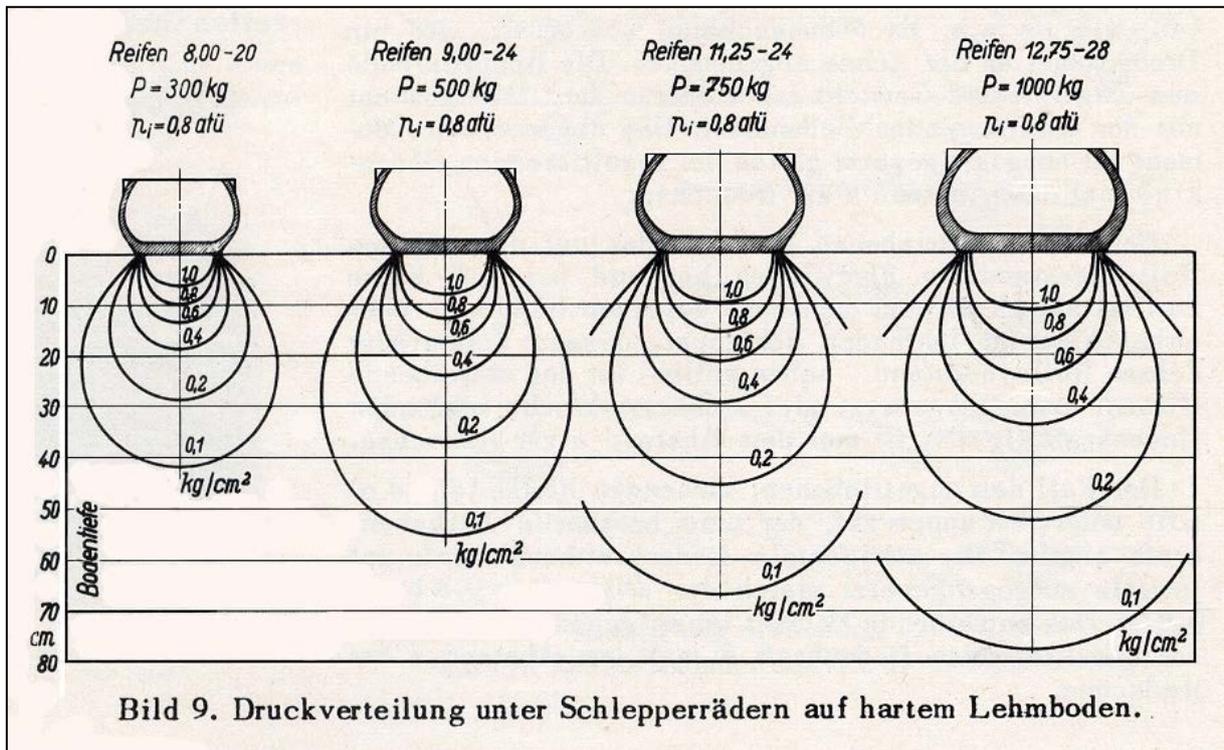
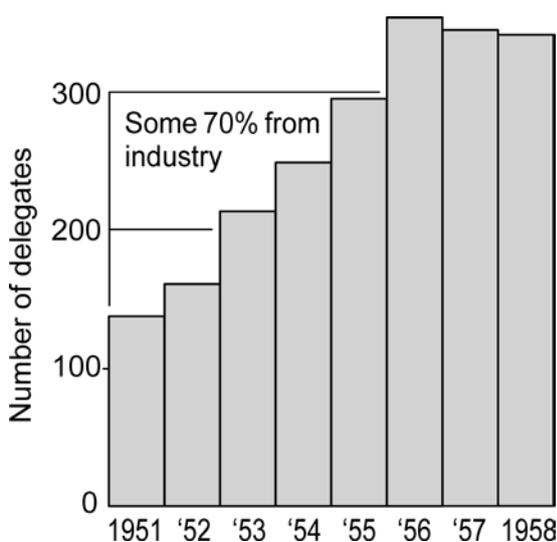


Figure 5: First (original) diagram of *W. Söhne's* “pressure bulbs”: Lines of constant vertical soil pressure under tires of unique inflation and contact pressures for firm soil [11]

These three examples and many other excellent papers were typical for the outstanding level of the 1951 conference and the following meetings. Many contributions are documented in the GRUNDLAGEN DER LANDTECHNIK, over five decades, being a source of basic fundamentals until today.



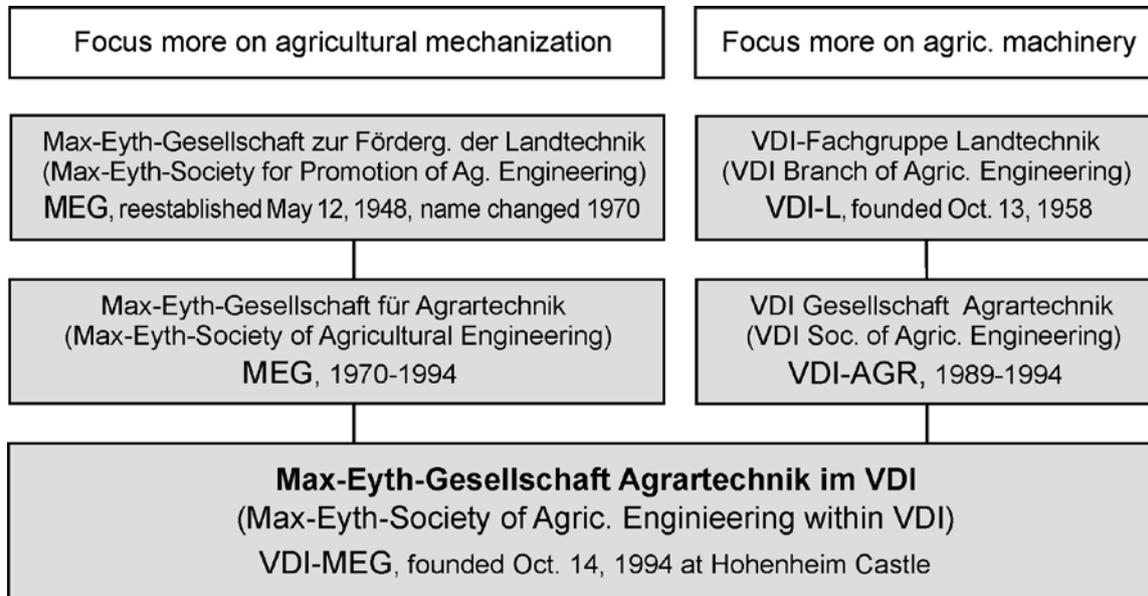
The result of the outstanding quality of the conferences was a permanent improved level of the German agricultural engineering and, consequently, also a permanent increase of the number of conference delegates, **Fig. 6**.

It may be respected, that also the outstanding high percentage of delegates from industry, in the first years some 70%, was indicating the value of the conference and its influence on agricultural innovations.

Figure 6: Number of delegates of the first conferences 1951-1958. Diagram based on [8].

The development of this conference entered a new phase when the VDI Branch of Agricultural Engineering (VDI-L) was founded in 1958, **Table 3** [12].

Table 3: Development of the German societies of agricultural engineering after World War II



2. Conference organization moving towards VDI and MEG

The “VDI Fachgruppe Landtechnik” (VDI Branch of Agricultural Engineering) was becoming engaged in the conference organization from 1962, **Table 4**.

Prof. Georg Segler (1906-1978) was the driving wheel of grading up the conference importance by engaging both, the VDI and the MEG.

He was supported by *Kloth*, whose annual meetings ended in 1964 after an overlapping in 1962, 1963 and 1964, Table 1 and 4, but *Kloth’s* successful philosophy of focusing on engineering fundamentals was integrated in the new format.

In 1983, *Prof. H.J. Matthies* (1921-2016) took over the chair of the VDI-L (Table 4). In this year, the Conference Landtechnik was for the first time organized commonly by VDI and MEG under the chairmanship of *Prof. Alfred Stoppel* (a son of *Theodor Stoppel*) and with support of *Prof. H. Eichhorn*, at that time President of MEG. *Matthies* presented in his conference welcome the vision, that MEG and VDI-L should put together all efforts to make a further step of co-operation by merging the two societies.

Some years later, this vision was accompanied by a memorable meeting of German professors, organized by *A. Stoppel* (Ulm Oct. 9, 1990), welcoming colleagues from universities of East Germany (the former DDR) along with the German unification.

Table 4: The German conferences 1962-2017 - data courtesy *Dr. A. Herrmann*, VDI-MEG

No.	Year	Location	Conf. Chairman	Organizer	Society Chairman
20	1962	Köln	-	VDI Agric. Eng. Dep.	Prof. Segler
21	1963	Heidelberg	-	VDI Agric. Eng. Dep.	Prof. Segler
22	1964	Münster	-	VDI Agric. Eng. Dep.	Prof. Segler
23	1965	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Segler
24	1966	Stuttgart	-	VDI Agric. Eng. Dep.	Prof. Segler
25	1967	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Segler
26	1968	München	-	VDI Agric. Eng. Dep.	Prof. Segler
27	1969	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Segler
28	1970	Ulm	-	VDI Agric. Eng. Dep.	Dr. Eggenmüller
29	1971	Braunschweig	-	VDI Agric. Eng. Dep.	Dr. Eggenmüller
30	1972	München	-	VDI Agric. Eng. Dep.	Dr. Eggenmüller
31	1973	Braunschweig	-	VDI Agric. Eng. Dep.	Dr. Eggenmüller
32	1974	Stuttgart	-	VDI Agric. Eng. Dep.	Prof. Schilling
33	1975	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Schilling
34	1976	München	-	VDI Agric. Eng. Dep.	Prof. Schilling
35	1977	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Schilling
36	1978	Nürnberg	-	VDI Agric. Eng. Dep.	Prof. Schilling
37	1979	Braunschweig	-	VDI Agric. Eng. Dep.	Prof. Schilling
38	1980	Neu-Ulm	-	VDI Agric. Eng. Dep.	Dipl.-Ing. Logos
39	1981	Braunschweig	Prof. Stroppel	VDI Agric. Eng. Dep.	Dipl.-Ing. Logos
40	1982	Neu-Ulm	Prof. Stroppel	VDI Agric. Eng. Dep.	Dipl.-Ing. Logos
41	1983	Braunschweig	Prof. Stroppel	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
42	1984	Neu-Ulm	Prof. Renius	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
43	1985	Braunschweig	Prof. Renius	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
44	1986	Neu-Ulm	Prof. Renius	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
45	1987	Braunschweig	Prof. Renius	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
46	1988	Neu-Ulm	Prof. Renius	VDI Agric. Eng. Dep.+ MEG	Prof. Matthies
47	1989	Köln	Prof. Renius	VDI Agric. Eng. Soc.+ MEG	Prof. Göhlich
48	1990	Berlin	Prof. Göhlich	VDI Agric. Eng. Soc.+MEG+AgEng	Prof. Göhlich
49	1991	Braunschweig	Prof. Renius	VDI Agric. Eng. Soc.+ MEG	Prof. Göhlich
50	1992	Freising-Weih.	Prof. Renius	VDI Agric. Eng. Soc.+ MEG	Dr. Welschof
51	1993	Braunschweig	Prof. Harms	VDI Agric. Eng. Soc.+ MEG	Dr. Welschof
52	1994	Hohenheim	Prof. Harms	VDI Agric. Eng. Soc.+ MEG	Dr. Welschof
53	1995	Braunschweig	Prof. Harms	VDI-MEG (Merger)	Prof. Renius
54	1996	Berlin	Prof. Hahn	VDI-MEG	Prof. Renius
55	1997	Braunschweig	Prof. Hahn	VDI-MEG	Prof. Renius
56	1998	München	Prof. Auernhammer	VDI-MEG	Dr. Ratschow
57	1999	Braunschweig	Prof. Auernhammer	VDI-MEG	Dr. Ratschow
58	2000	Münster	Prof. Auernhammer	VDI-MEG	Dr. Ratschow
59	2001	Hannover	Prof. Auernhammer	VDI-MEG, Coop. with EurAgEng	Dr. Ratschow
60	2002	Halle	Prof. Auernhammer	VDI-MEG	Dr. Ratschow
61	2003	Hannover	Prof. Auernhammer	VDI-MEG, Coop. with EurAgEng	Dr. Ratschow
62	2004	Dresden	Dr. Ehlert	VDI Wissensforum + VDI-MEG	Prof. Frerichs
63	2005	Hannover	Dr. Ehlert	VDI Wissensforum + VDI-MEG	Prof. Frerichs
64	2006	Bonn	Prof. Munack	VDI-MEG + EurAgEng + CIGR	Prof. Frerichs
65	2007	Hannover	Dr. Ehlert	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Frerichs
66	2008	Hohenheim	Dr. Ehlert	VDI Wissensforum + VDI-MEG	Prof. Frerichs
67	2009	Hannover	Prof. Lang	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Böttinger
68	2010	Braunschweig	Prof. Lang	VDI Wissensforum + VDI-MEG	Prof. Böttinger
69	2011	Hannover	Prof. Lang	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Böttinger
70	2012	Karlsruhe	Prof. Lang	VDI Wissensforum + VDI-MEG	Prof. Böttinger
71	2013	Hannover	Prof. Lang	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Böttinger
72	2014	Berlin	Prof. Meyer	VDI Wissensforum + VDI-MEG	Prof. Böttinger
73	2015	Hannover	Prof. Meyer	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Pickel
74	2016	Köln	Prof. Meyer	VDI Wissensforum + VDI-MEG	Prof. Pickel
75	2017	Hannover	Prof. Meyer	VDI Wiss.+VDI-MEG+EurAgEng	Prof. Pickel

The idea of *Prof. Hans Jürgen Matthies*, to merge MEG and VDI-AGR, was not only supported by the conferences but also by several special meetings of leading German personalities such as *Prof. H. Eichhorn*, *Prof. H. Göhlich*, *Prof. A. Gego*, *Dr. G. Welschof*; *Dr. F. Meier*, *Prof. H. Schön* and *Prof. K.-Th. Renius* [12] – usually chaired by *Matthies*.

The merger finally took place in Oct. 14, 1994 at the beautiful Hohenheim Castle directed by *Prof. Matthies*, Table 3 [1, 12]. *Prof. Renius* was elected as its first President [13].

3. Facing Europe by again widened circles

An important step versus “more Europe” was the famous AgEng’84 Conference in Cambridge, UK, chaired by *Prof. John Matthews*, supported by *Prof. Francis Sevilla*, France and from Germany by *Prof. Horst Göhlich*. The huge success motivated to continue with this conference: AgEng’86 in Noordwijkerhout, the Netherlands (*A. Hagting*), AgEng’88 in Paris, France (*F. Sevilla*), AgEng’90 in Berlin, Germany (*H. Göhlich*). The Berlin meeting was the first combination with our annual German conference and a successful step towards a European Society replacing the “AgEng Working Party” (which had prepared the first four AgEng Conferences). The European Society of Agricultural Engineers, the EurAgEng, was prepared during 1991 and officially established January 1, 1992. *Professor Francis Sevilla* (1949-2010), an outstanding promoter, was elected as its first President.

EurAgEng celebrates 2017 its 25th anniversary

Our congratulation and very best wishes!

The mentioned unification of the two German societies in 1994 became a powerful platform for further improvements. *Prof. H. Auernhammer* being the chairman of the German conferences 1998-2003 (Table 4) could achieve a co-operation with DLG (German Society of Agriculture) and ICC (Hannover Fair) to run the annual conference “Landtechnik” 2001 for the first time ahead of AGRITECHNICA. The increased participation of 469 delegates (63% from industry) confirmed the new concept. *Auernhammer* proposed to the EurAgEng Board Meeting April 12, 2003 in Rome, to make a further step in 2003 at Hannover by a parallel English session “Young Engineers for Europe”. This was realized, but in the meantime there was an important meeting of the **EurAgEng Council June 14, 2003** in Leuven, Belgium in which *Prof. Auernhammer* (and the German delegates *Prof. Renius* and *Prof. Zaske*) now proposed a complete merger of the German VDI-MEG Conference “Landtechnik” with the “AgEng Conference” in the uneven years, ahead of Agritechnica. After critical discussions, the Council agreed realizing this from 2007, supported by *Prof. Josse de Baerdemaeker* (Belgium, EurAgEng President 1996/98). This was in my opinion a wise decision for both parties as the number of delegates increased to 659, later on even to about 1000.

The successful process towards “more Europe” was also considerably supported by CIGR by organizing its World Congress 2006 together with EurAgEng and VDI-MEG in Bonn, Sept. 3-7 under the motto “Agricultural Engineering for a Better World”.

This important event, chaired by Prof. A. Munack (CIGR) with assistance of Dr. Ehlert (VDI-MEG) and Prof. Bill Day (EurAgEng) celebrated its Evening Session in the former German House of Parliament, **Fig. 7**.

Our acknowledgement may address all engaged colleagues for contributing to this outstanding success story including EurAgEng and CIGR representatives.



Figure 7: CIGR World Congress 2006 jointly with EurAgEng and VDI-MEG Sept. 3-7, 2006. Evening Session on Sept. 5 in the former German House of Parliament, Bonn.

On the “Chancellor’s Bank” in the first row left Prof. Luis Santos Pereira (President CIGR), Prof. Bill Day (President EurAgEng) and Dr. Ludger Frerichs (President VDI-MEG).

At the desk Eckhard Uhlenberg, Minister of Agriculture of NRW.

Foto: CIGR Bonn

References

- [1] Stroppe, A.: Vorgeschichte und Entstehung der VDI-Fachgruppe Landtechnik (Foundation of the VDI Branch of Agric. Engng.). In: Renius, K.Th. (ed.): 25 Jahre VDI-Fachgruppe Landtechnik, 1-15. Düsseldorf: VDI Fachgruppe Landtechnik 1983.
- [2] Matthies, H.J.: Die strukturelle Entwicklung der deutschen Landtechnik im 20. Jahrhundert (Structure development of the German agricultural engineering during the 20th century). Plenary presentation at Landtechnik Conference Braunschweig Oct. 10, 1995. Revised version in: Supplement of Landtechnik 51 (1996) No. 1, 2-9.
- [3] Söhne, W.: 100 Jahre Willi Kloth ... (Willi Kloth born 100 years ago ...). Plenary speech 49. Internationale Tagung Landtechnik, Braunschweig 1991. Proceedings 1-3.
- [4] Söhne, W.: Professor Willi Kloth zum Gedenken (Commemorating Professor Willi Kloth). Grundl. Landtechnik 18 (1968) No. 1, 11-13.
- [5] Söhne, W.: Theodor Stroppe zum 75. Geburtstag (Congratulating Theodor Stroppe on his 75. birthday). Grundl. Landtechnik 26 (1976) No. 4, 150.
- [6] Söhne, W.: Theodor Stroppe †. Grundl. Landtechnik 31 (1981) No. 4, 142-143.
- [7] Kloth, W.: Entwicklungsmöglichkeiten der Landtechnik von der Grundlagenforschung her gesehen (Development of agricultural engineering from the view of basic research). Grundl. Landtechnik 3 (1952), 5-11.
- [8] Stroppe, Th.: Die Tagungen der Landmaschinen-Konstrukteure 1934 -1958. (Conferences of agric. engineering 1934-1958). Grundl. Landtechnik 10 (1958), 1-3.
- [9] Kloth, W. and Th. Stroppe: Der Energiefluß im Zapfwellenbinder (Energy flow within the PTO driven binder), Teil I-III (Part I-III). Technik in der Landwirtschaft 13 (1932), No. 2, 49-50, No. 3, 66-69 and No. 4, 88-91. See also Z. VDI 78 (1934) No. 21, 629-632 and Z. VDI 80 (1936) No. 4, 85-92.
- [10] Bergmann, W.: Steifigkeit sperriger Bauteile (Stiffness of bulky design elements). Grundl. Landtechnik 1 (1951), 61-67.
- [11] Söhne, W.: Das mechanische Verhalten des Ackerbodens bei Belastungen unter rollenden Rädern sowie bei der Bodenbearbeitung (Soil mechanics under loaded rolling tires and soil tillage mechanics). Grundl. Landtechnik 1 (1951), 87-94
- [12] Matthies, H.J. et al.: Geschichte der Max-Eyth-Gesellschaft Agrartechnik im VDI (History of the Max-Eyth-Society of Agricultural Engineering, section of VDI). Düsseldorf: VDI-MEG 2006.
- [13] Renius, K.Th.: 50 Jahre Agrartechnik im VDI – ein Stück Landtechnikgeschichte. (50 years of agric. engineering within VDI – a piece of agricultural engineering history). Der Goldene Pflug, 28 (2008), 4-12. Hohenheim: Soc. German Museum of Agriculture.