June 20, 2011 (Monday) Pre-Congress Seminars

Ministry of Rural Development **Kossuth Lajos tér 11. Budapest V.**
CONFERENCE ROOM **Monday 10:00 – 18:00**

NEW QUALITY AND SAFETY REGULATIONS AND DEVELOPMENTS ON THE AGRIFOOD AREA

Seminar Chair: Zoltán Kálmán, Ministry of Rural Development, Hungary

10.35 Food Safety Challenges in the 21st Century

Tamás Németh, Hungarian Academy of Sciences, Hungary

Németh, Tamás (Hungary)

Tamás Németh completed the Agricultural University, Keszthely, Hungary in 1976 studying soil science and agrochemistry. In 1997 he became D.Sc. of the Hungarian Academy of Sciences; and in 1998 habilited at the PANNON Agricultural University, Keszthely. He is Ordinary Member of the Hungarian Academy of Sciences since 2007 and Foreign Member of the Royal Swedish Academy of Agriculture and Forestry beginning from 1998. Since 2008 he is Secretary General of the Hungarian Academy of Sciences. Between 1997-2008 Tamás Németh worked as Director at the Research Institute for Soil Science and Agricultural Chemistry (RISSAC) of the Hungarian Academy of Sciences, Budapest, Hungary. He is also Guest Professor at the PANNON Agricultural University, Department of Agricultural Chemistry, Keszthely.

55th EOQ Congress as World Quality Congress
"Navigating Global Quality in a New Era"

NEW QUALITY AND SAFETY REGULATIONS AND DEVELOPMENTS ON THE AGRIFOOD AREA

Food Safety Challenges in the 21st Century

Tamás Németh
Hungarian Academy of Sciences (HAS)

June 20, 2011
Budapest

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The elementary factors of quality of life

- clear water;
- clean air;
- sufficient quality and quantity foods.

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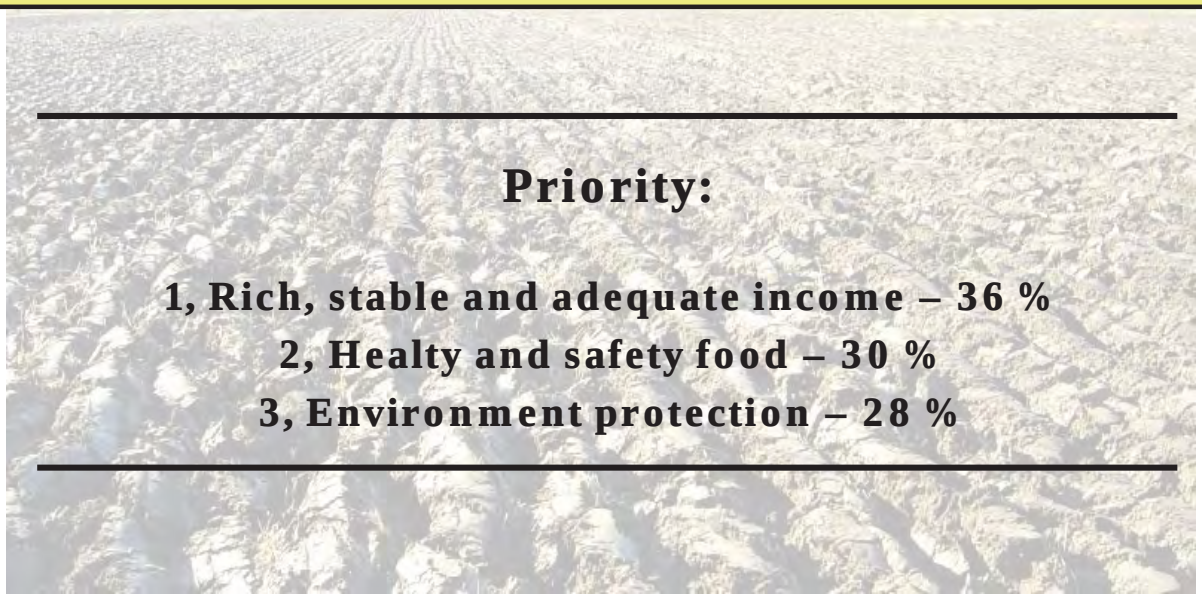
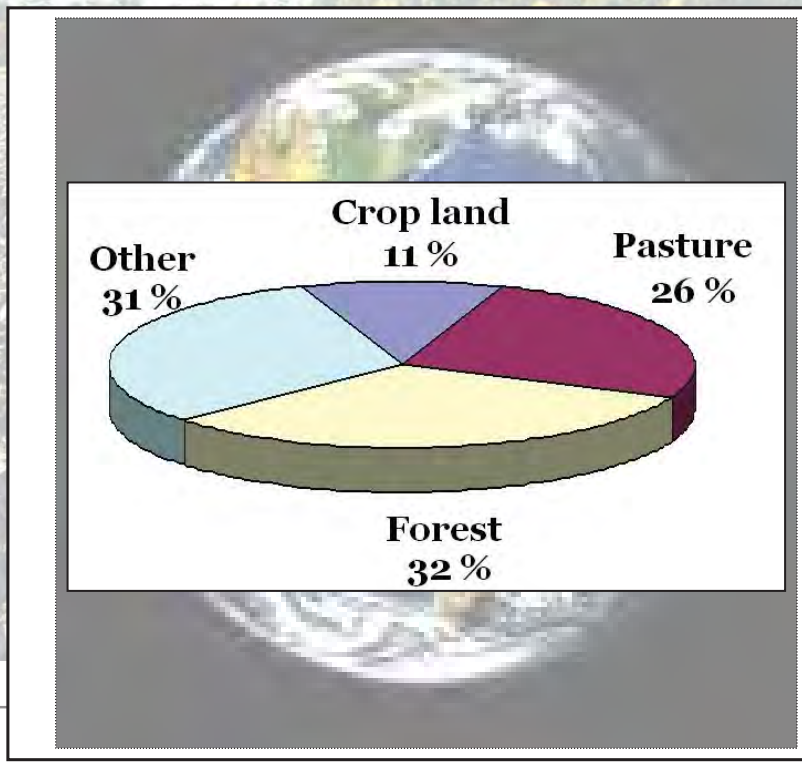
Assessment of CAP assistance
22 November – 19 December, 2004
(25 thousand citizens of 25 member-states)



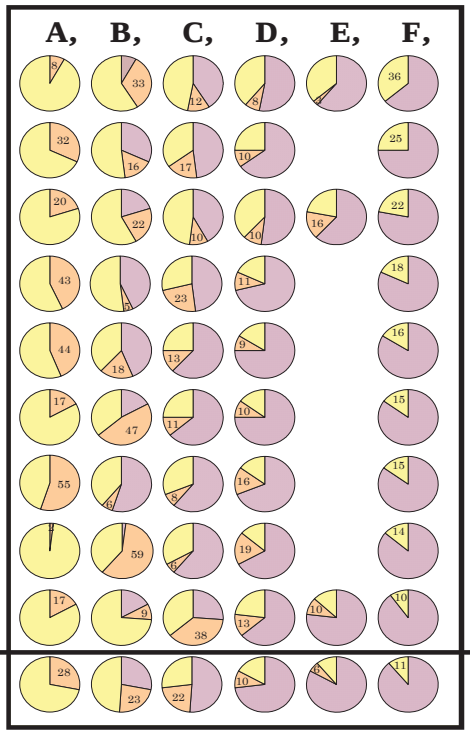
Priority:

1, Rich, stable and adequate income – 36 %
2, Healty and safety food – 30 %
3, Environment protection – 28 %

The formation of landuse in the World



The main limitation factors of the World agricultural production (in the mainland percentage)



A, drought. B, nutrient stress. C, shallow arable layer.
D, extreme precipitation. E, permafrost. F, arable soil

The world is changing quickly and dramatically bringing a range of challenges to European agriculture,
including climate change, environmental impacts on natural resources, globalisation and increasing competition, demographic changes, advances in science and technology.

The need for research and innovation is clear.

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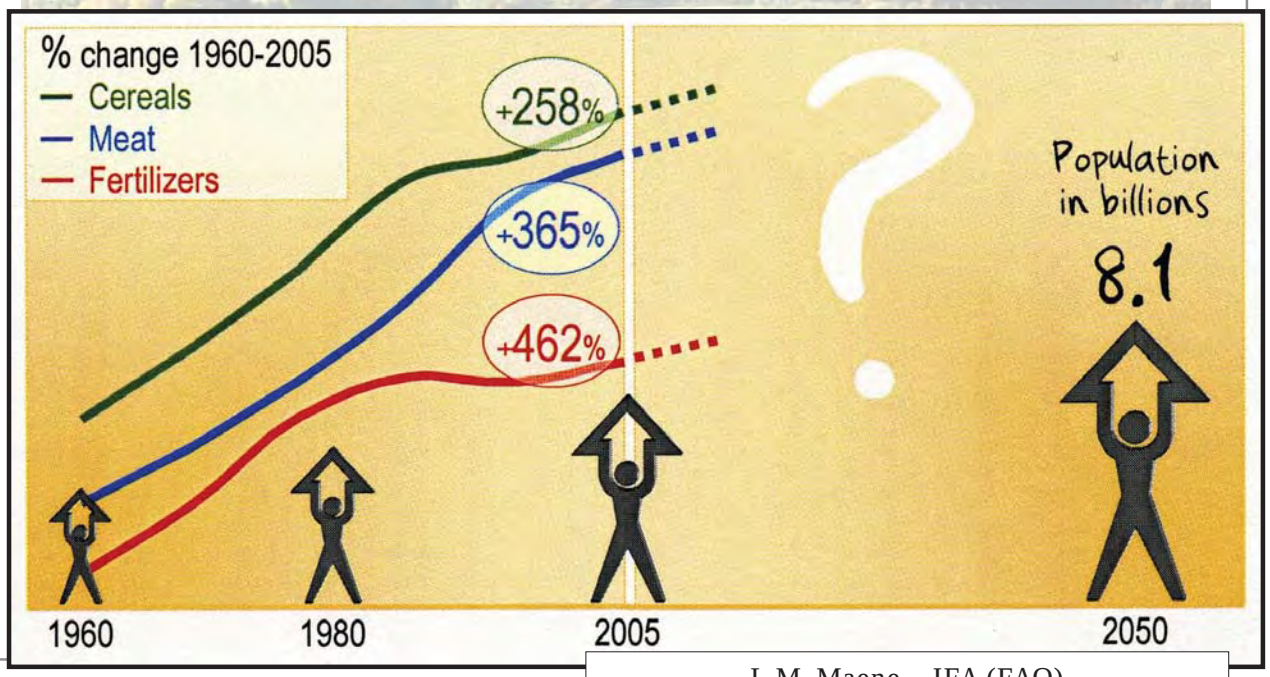
Feeding a Growing Population



L.M. Maene – IFA (FAQ)

The Changes of Cultivated Lands of the World between 1850-1980 (1850 = 100 %)

South Asia	296%
South-East Asia	770%
Europe	96%
North America	409%
China	179%
Latin America	777%
Soviet Union	247%
Tropical Africa	388%
Total	279%

IIED-WRI, 1987

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Leonardo da Vinci
(1452 – 1519)

Italian polymath, scientist, mathematician, engineer, inventor, anatomist, painter, sculptor, architect, botanist, musician and writer

"We know more about the movement of celestial bodies than about the soil underfoot."

"We might say that the earth has the spirit of growth; that its flesh is the soil."

Exposure of soil and soil water as natural resources to potential sources of contamination and their overuse

Potential sources of soil contamination

Watering, fertilizing, using plant protection products, geogen pollution sources, urbanization, surface water bodies, waste disposal, spoil banks, plants, natural and artificial soil water fill ups, special use of reservoirs

Risk of contamination

Soil and soil water as natural resources

Risk of overuse

Increasing intensity of agricultural and forest production, soil water extraction drinking water, industrial and agricultural use, soil water bodies appearing on surface due to various field works

Soil and soil water use

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in case of **cultivated soils** –
human activity

Soil

primary aim in agricultural ecosystems
larger quantity and **better quality crops**

applying

soil cultivation, soil improvement,
manuring or irrigation.

Dynamic of soil moisture in long-term field experiment

One of the most valuable characteristics of soils is **fertility**.

Physical	Inorganic chemistry	Organic biological	Water-regime
• texture	• T, S value	• humus	• water-absorbing capacity
• speckle size	• calcium content	• tilth	
• structure	• pH	• fauna	• hydraulic conductivity
• pore volume	• macro nutrients	• fungi	
• temperature	• micro nutrients	• bacteriae	• waterholding capacity
• erosion		• CO_2	
			• capillary water
			• subsoil water

The **factors**, which form the soil fertility, after **Boguslawski (1965)**

Dynamic of soil moisture in long-term field experiment

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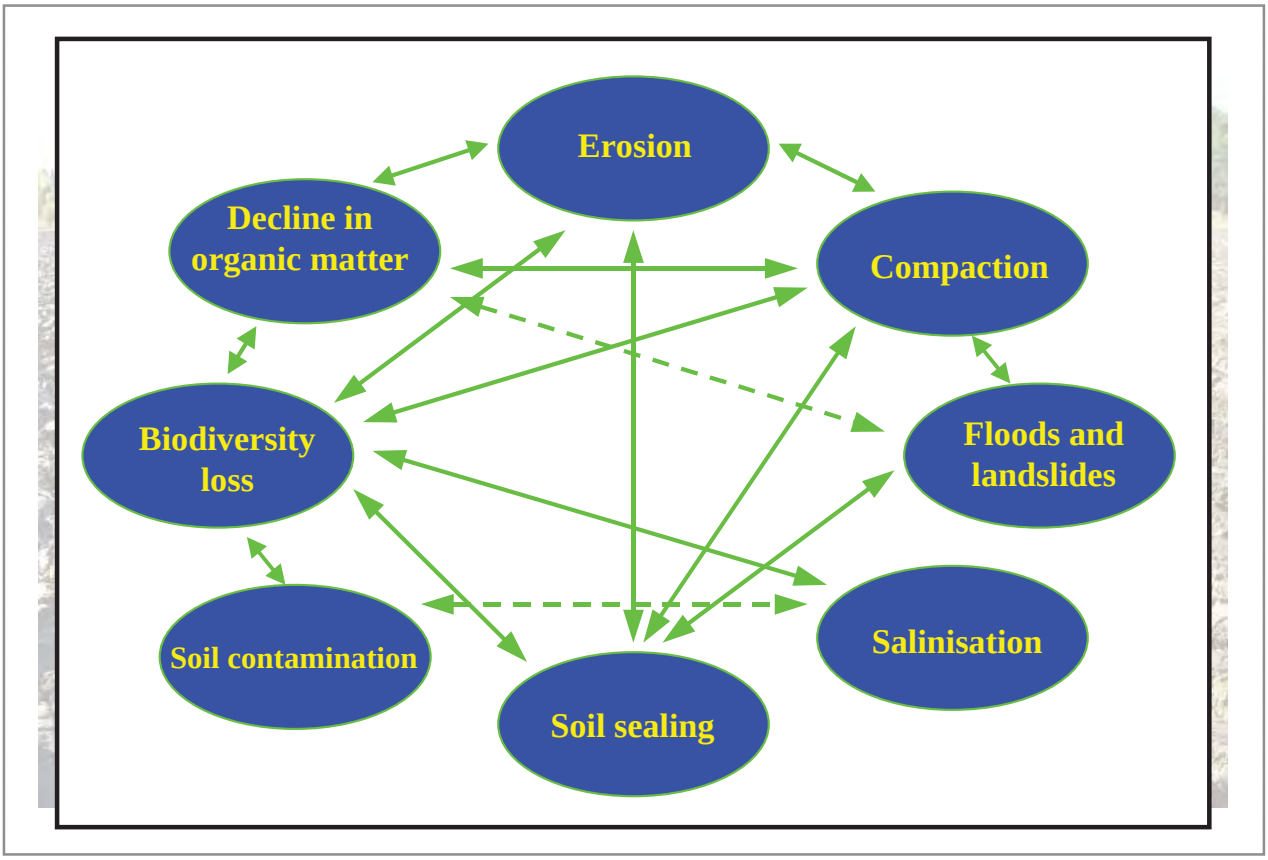

Soil threats

Soil Framework Directive

- Compaction
- Erosion
- Landslides
- Salinisation
- Organic matter decline
- Sealing
- Contamination
- Acidification
- Waterlogging

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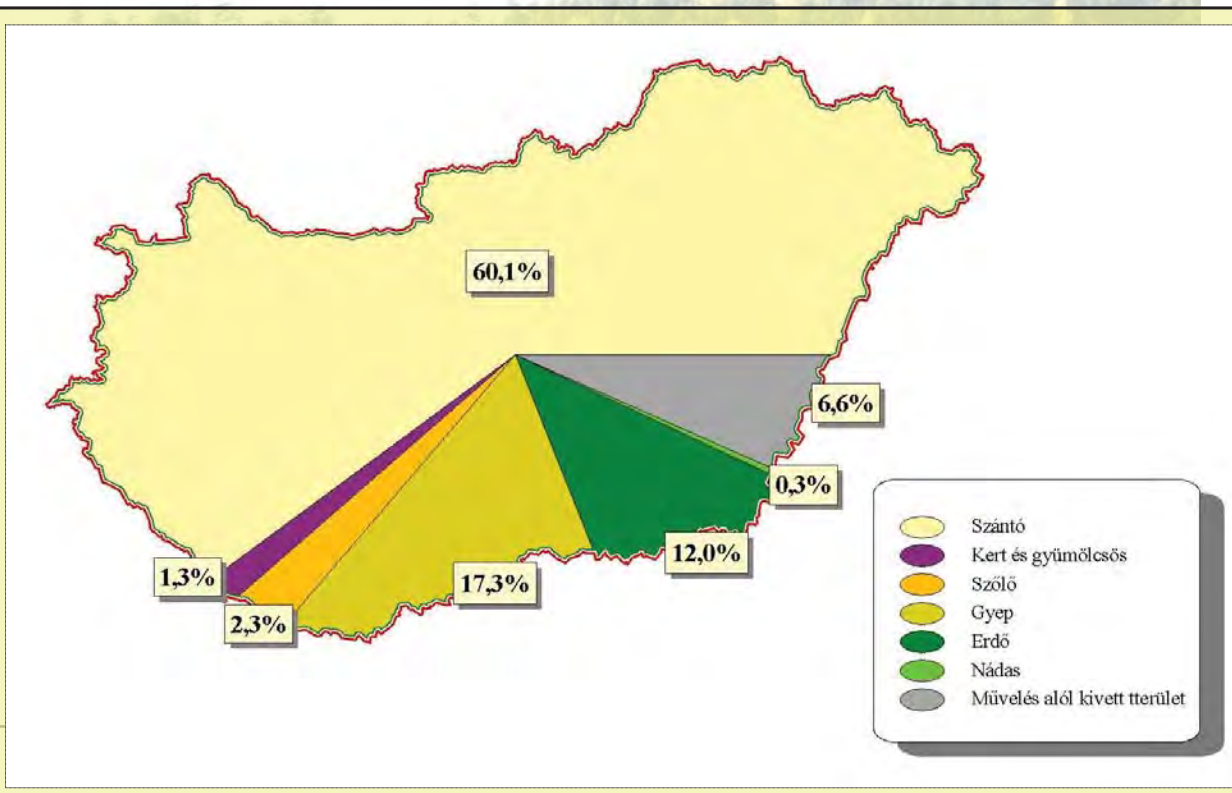
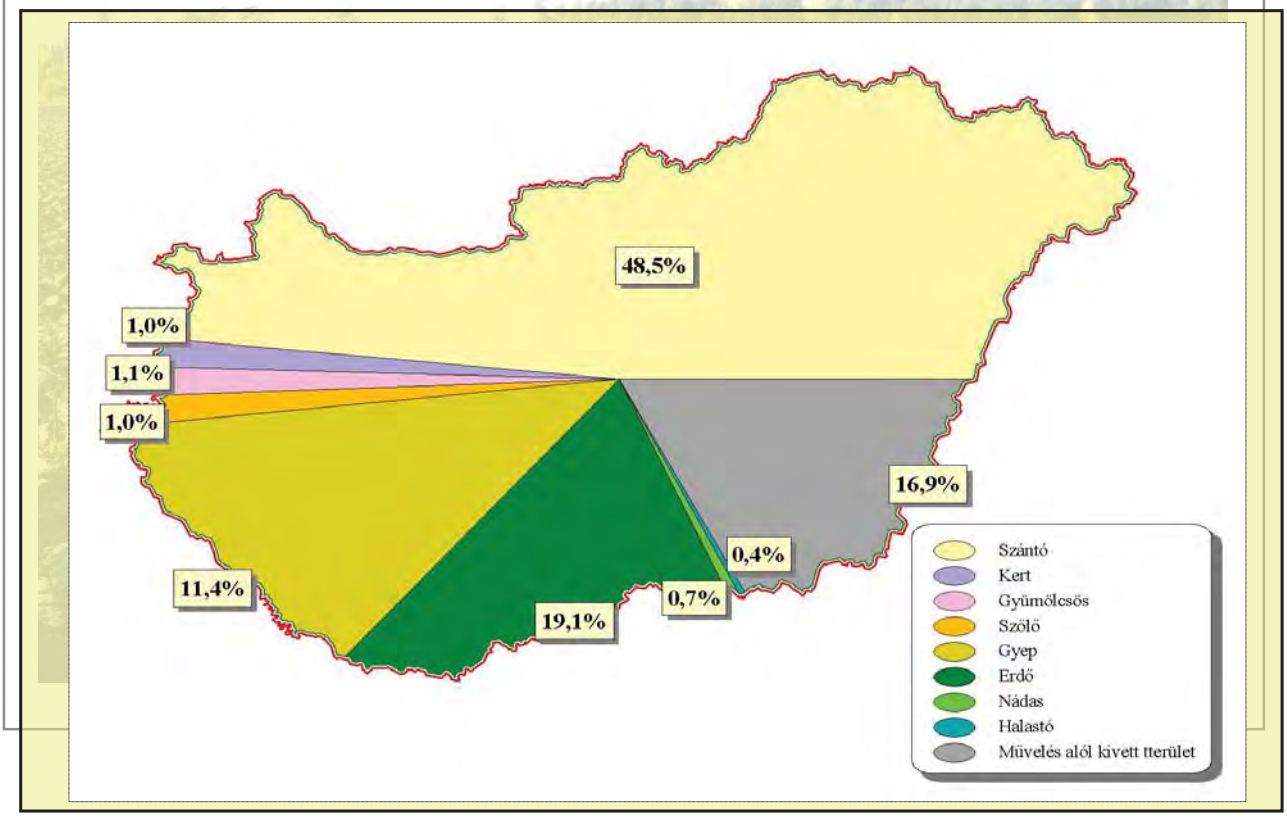
The Landuse of Hungary between 1931 and 1950 (in average)



The Landuse of Hungary
in the year of 2003



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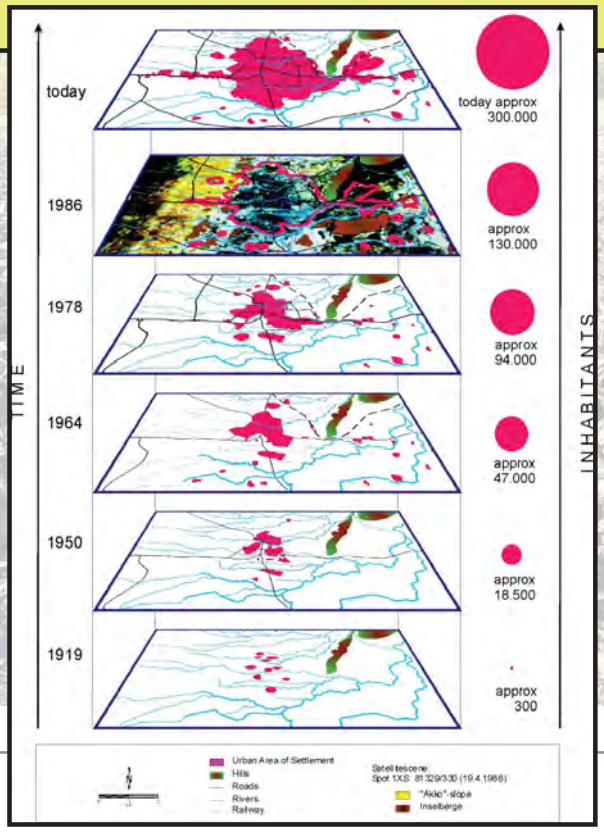
Urbanization of Gombe City, Nigeria
From 1919 to present



South Railway Station, Budapest
1873 and 1998

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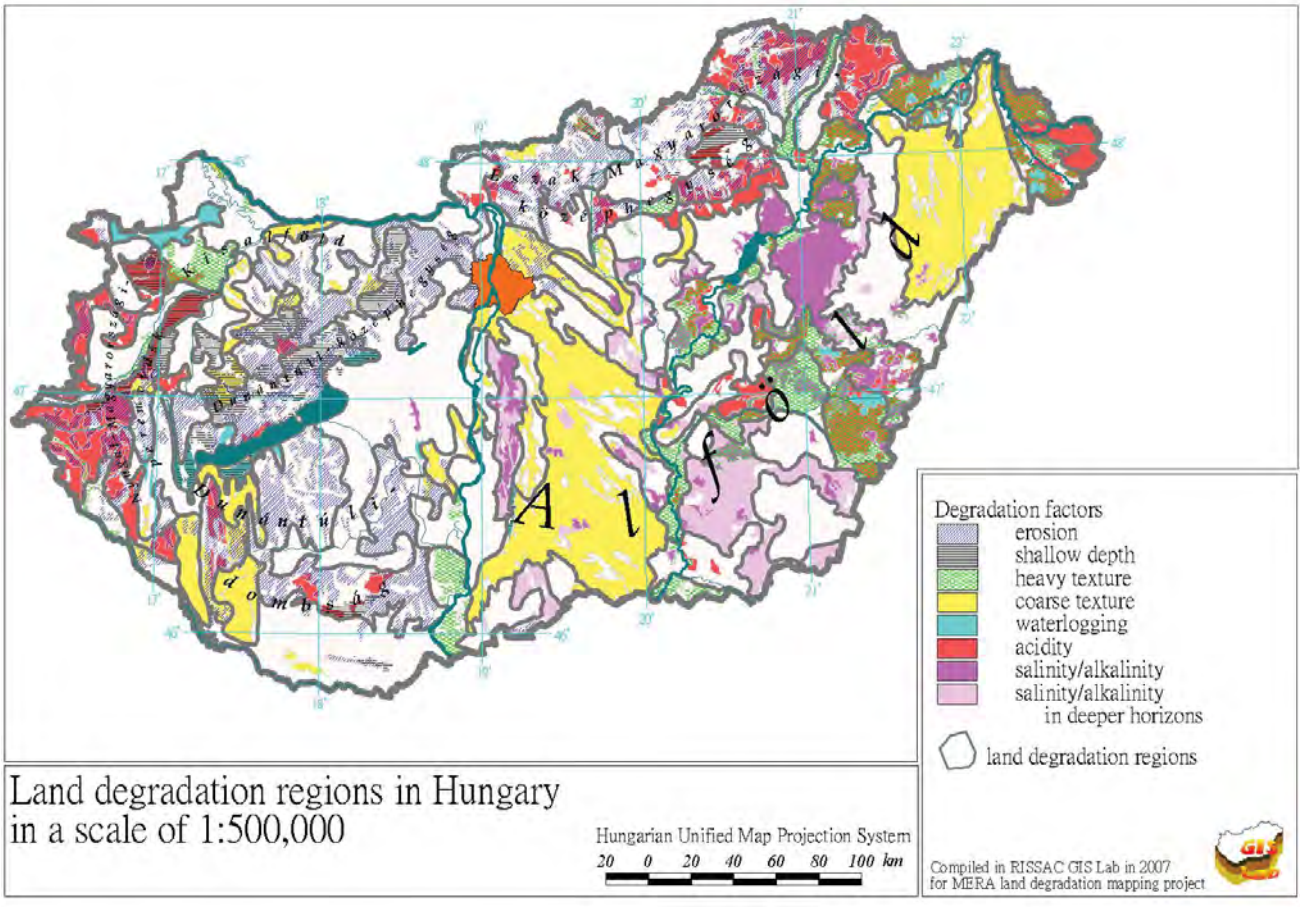

Land degradation regions in Hungary
in a scale of 1:500,000

Water logging in Hungary

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Surface layer erosion

ló

Deep erosion gullet

Picture: Péter László

Abandoned areas

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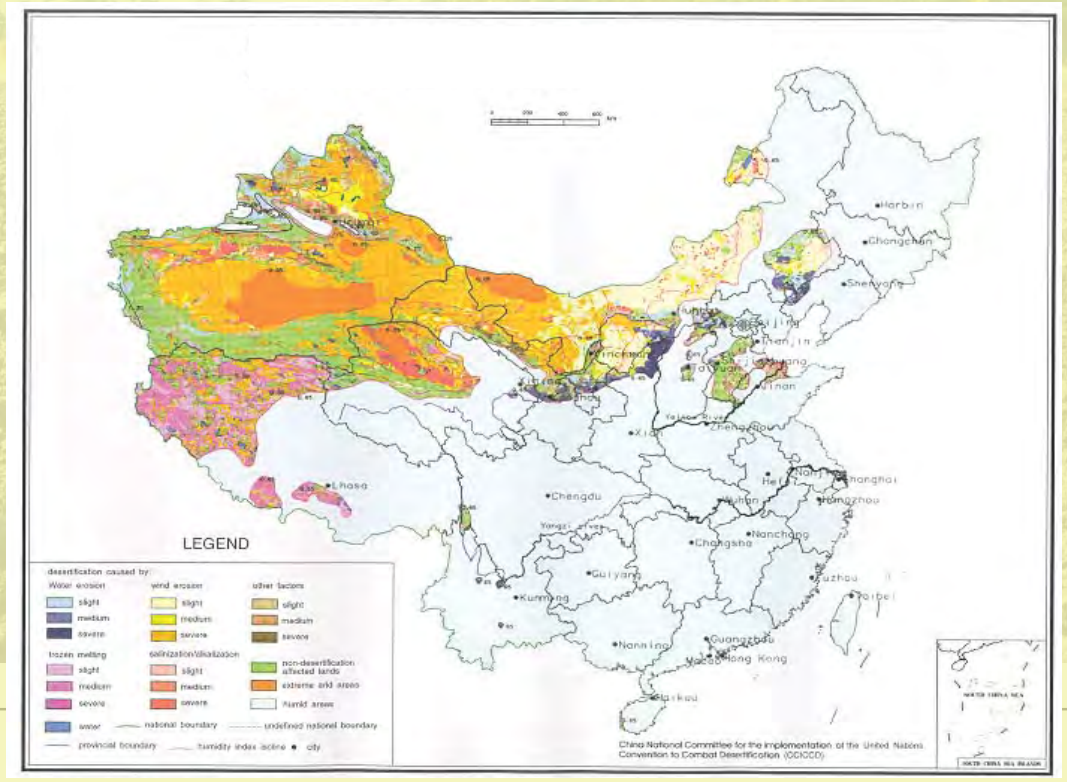
Sand storm in Peking

Map of distribution of desertification affected lands in China



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Aim

Development and widespread dissemination of site specific precision farming system.

Farmyard manure and fertilizer use in Hungary between 1931 and 2001

Statistical Yearbooks for Agriculture, KSH

Year	*Farmyard Manure* $Mg\ year^{-6}$	*Fertilizer active ingredients* $1000\ Mg\ year^{-1}$				*For arable lands* $kg\ ha^{-1}\ year^{-1}$
		N	P_2O_5	K_2O	Total	
1931-1940	22.4	1	7	1	9	2
1951-1960	21.2	33	33	17	83	15
1961-1965	20.6	143	100	56	299	57
1966-1970	22.2	293	170	150	613	109
1971-1975	14.8	479	326	400	1,205	218
1976-1980	14.3	556	401	511	1,468	250
1981-1985	15.4	604	394	495	1,493	282
1986-1990	13.2	559	280	374	1,213	230
1991-1995	6.0	172	25	26	223	44
1996-2000	4.8	235	40	42	317	63

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Development of the ratios of cultivation types from the total land area (%)

Based on Agricultural Statistical Almanac, 1991

Land use	Hungary	EU-15	OECD	World
Arable land, vegetable garden and fruit plantation	54.5	27.9	13.3	11.1
Grass	12.4	18.6	25.3	26
Agricultural area	66.9	46.5	38.6	37.1
Forestry	19.1	36.3	33.5	31.7
Area (1000 ha)	9 303	313 025	3 352 529	13 045 423

Fertilizer use in the countries of the European Union

farmland kg/ha active ingredient

	Nitrogen (N)	Phosphorus (P_2O_5)	Potassium (K_2O)	Total
Austria	33	16	19	68
Belgium/Luxemburg	117	35	61	213
Denmark	107	19	37	163
Finnland	81	26	36	143
French	83	37	47	167
Greece	59	26	13	98
Netherlands	188	34	33	255
Ireland	87	28	34	149
Great-Britain	79	25	28	132
Germany	103	24	38	165
Italy	55	31	24	110
Portugal	29	13	12	54
Spain	35	18	16	69
Sweden	66	16	17	99
EU 15	**70**	**26**	**30**	**126**

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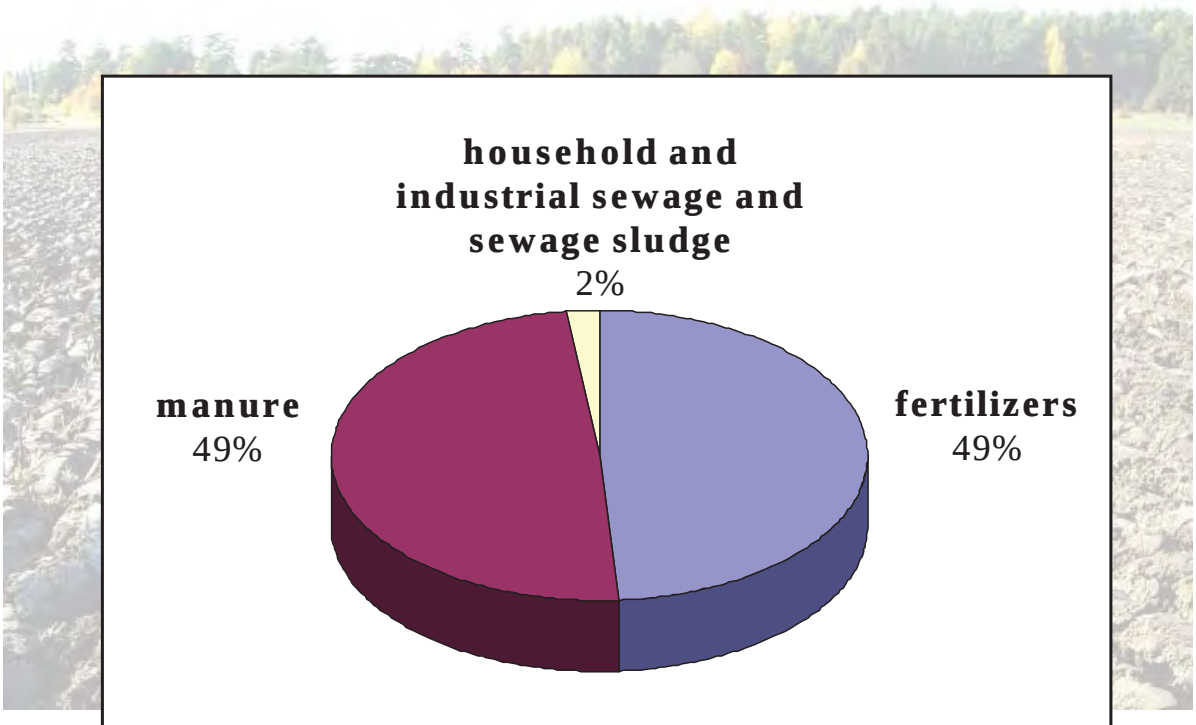
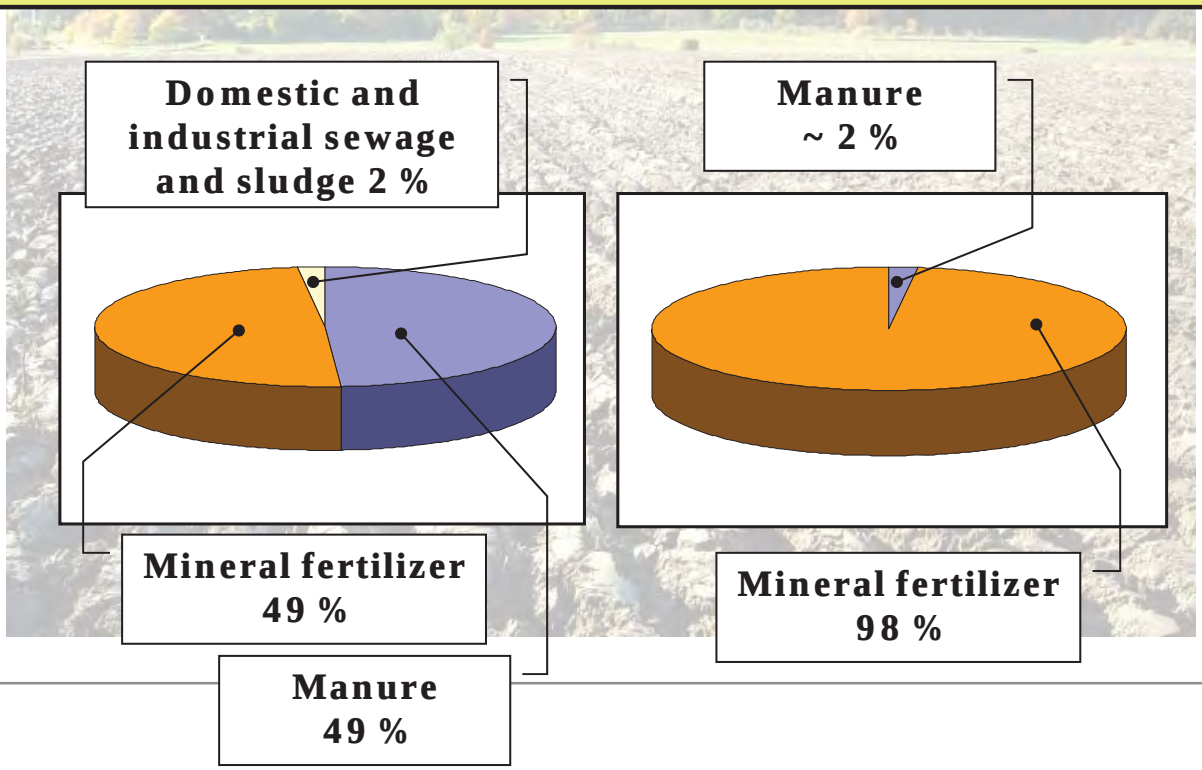
Nutrient use in the countries of the European Union



European Fertilizer Manufacturers Association (EFMA)

The application of fertilizers in the EU countries and in Hungary

European Fertilizer Manufacturers Association (EFMA)



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Agricultural research is being asked to address issues that are both multi- and interdisciplinary.

We will, therefore, need to go well beyond the traditional understanding of agriculture and agricultural research.

European agricultural research has to take a more pro-active approach, looking at options which can provide an advantage in global competition.

The growing importance and potential of food, feed, fibre, fuel and 'green' chemicals from land and water based production systems has to be given more attention.

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Interdisciplinary and long-term approaches are indispensable for three reasons:

1. for an early identification of emerging problems;
2. for the swift development of sound intervention strategies suited to improve and advance the long-term competitiveness of Europe's agricultural sector
3. for delivering what is demanded by society and policy.

The Good Agricultural Practice

Fitting into Environmental Conditions

Adjusted to Demands of Cultivated Plants

NUTRIENT SUPPLYING

CONSULTATION SYSTEM

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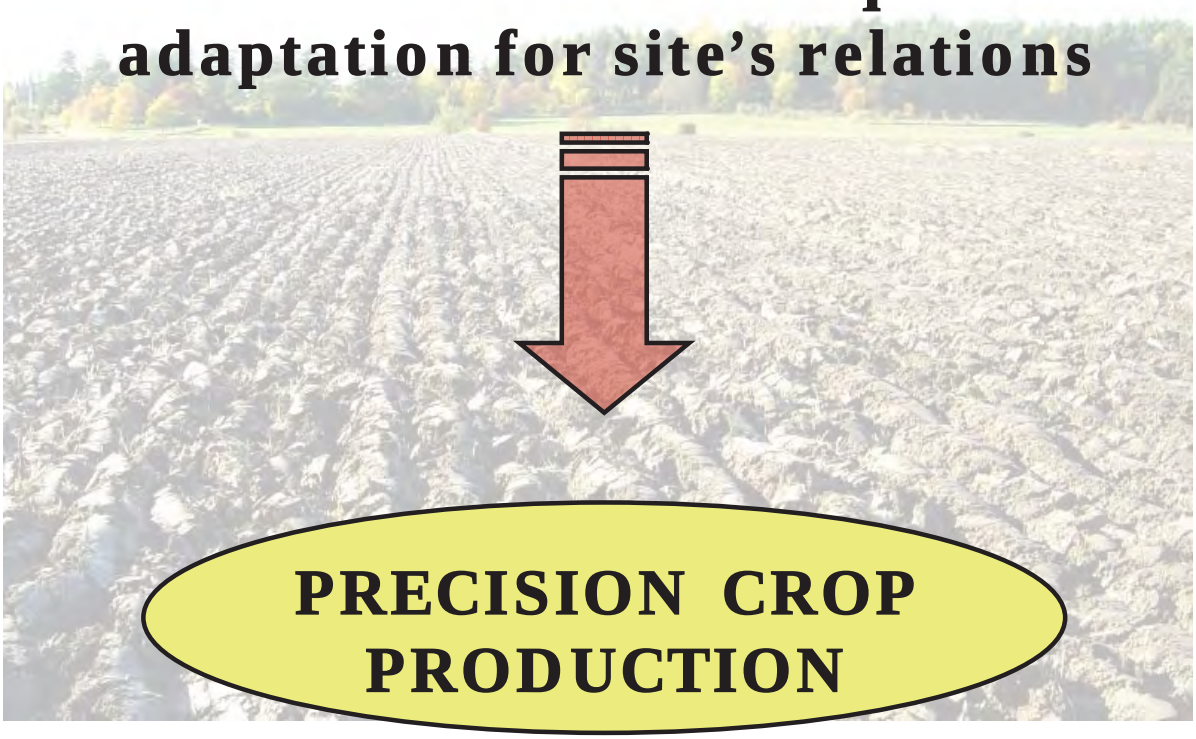
Cultivation technique adaptation for site's relations



PRECISION CROP PRODUCTION

Precision crop production

Refinement of inputs:

- seed
- fertilizer
- pesticide

Realization:

- varying technologies into tables
- integrated plant protection
- remote sensing, GIS, geo-statistic
- mechanization and automation

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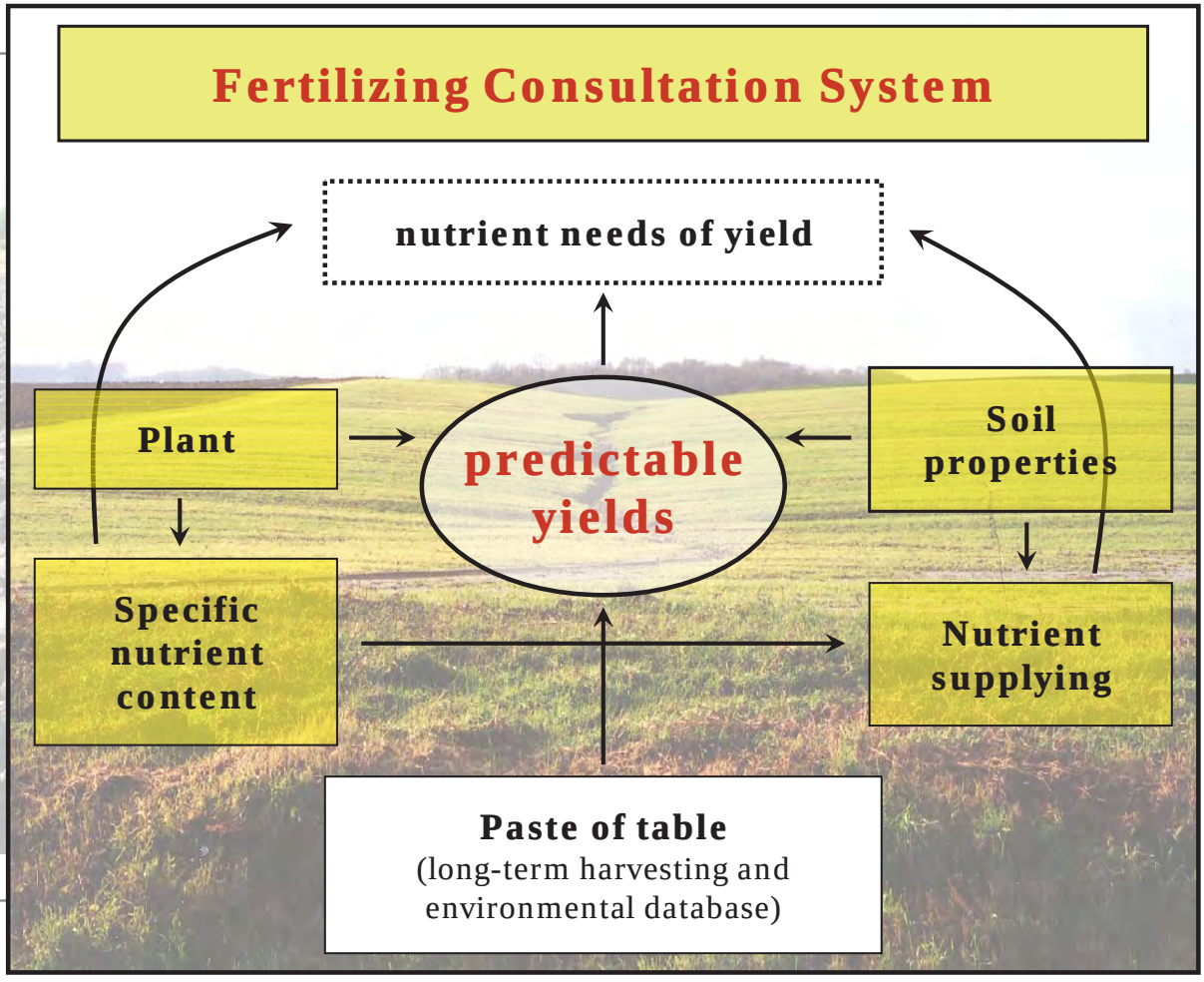
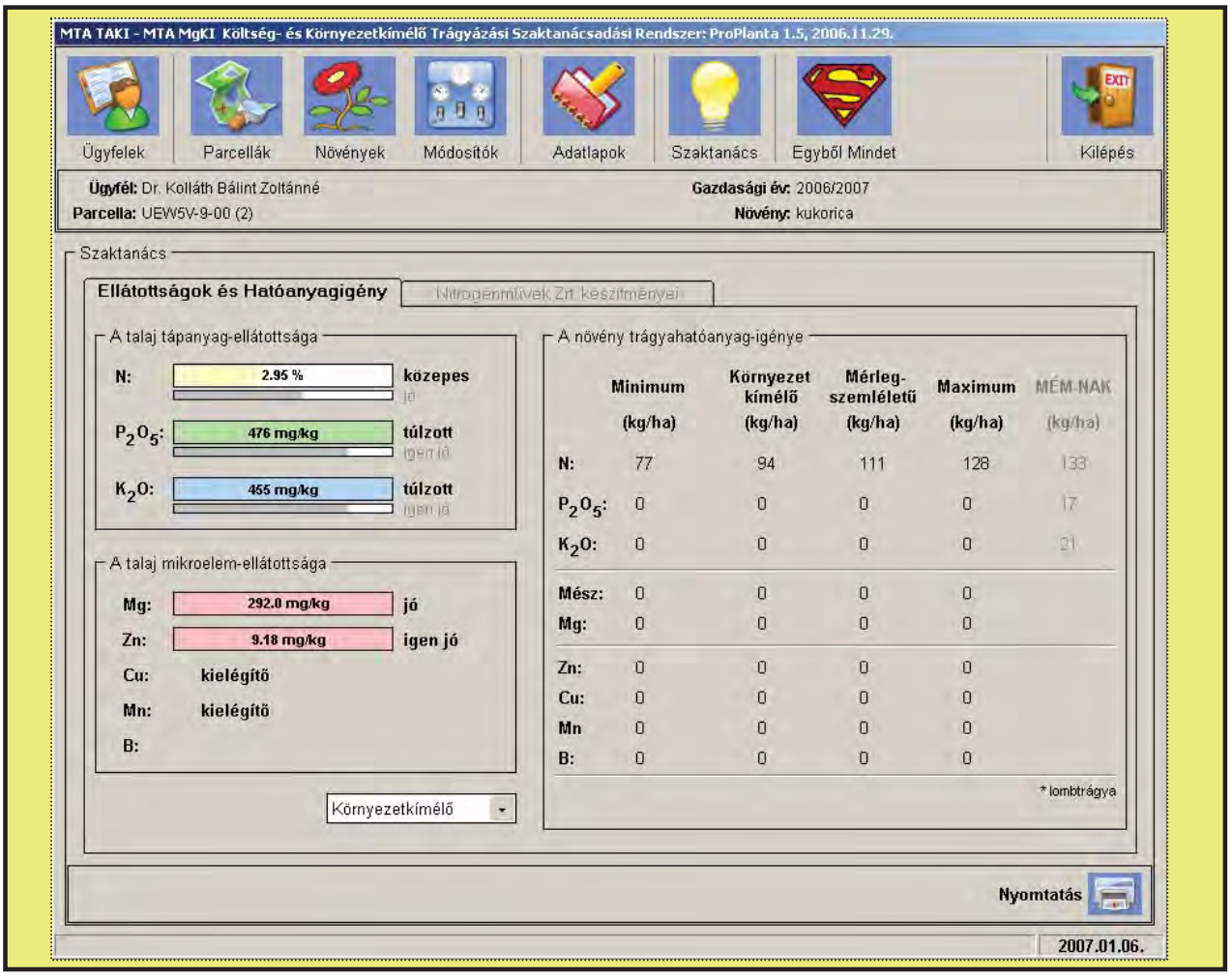
Fertilizing Consultation System





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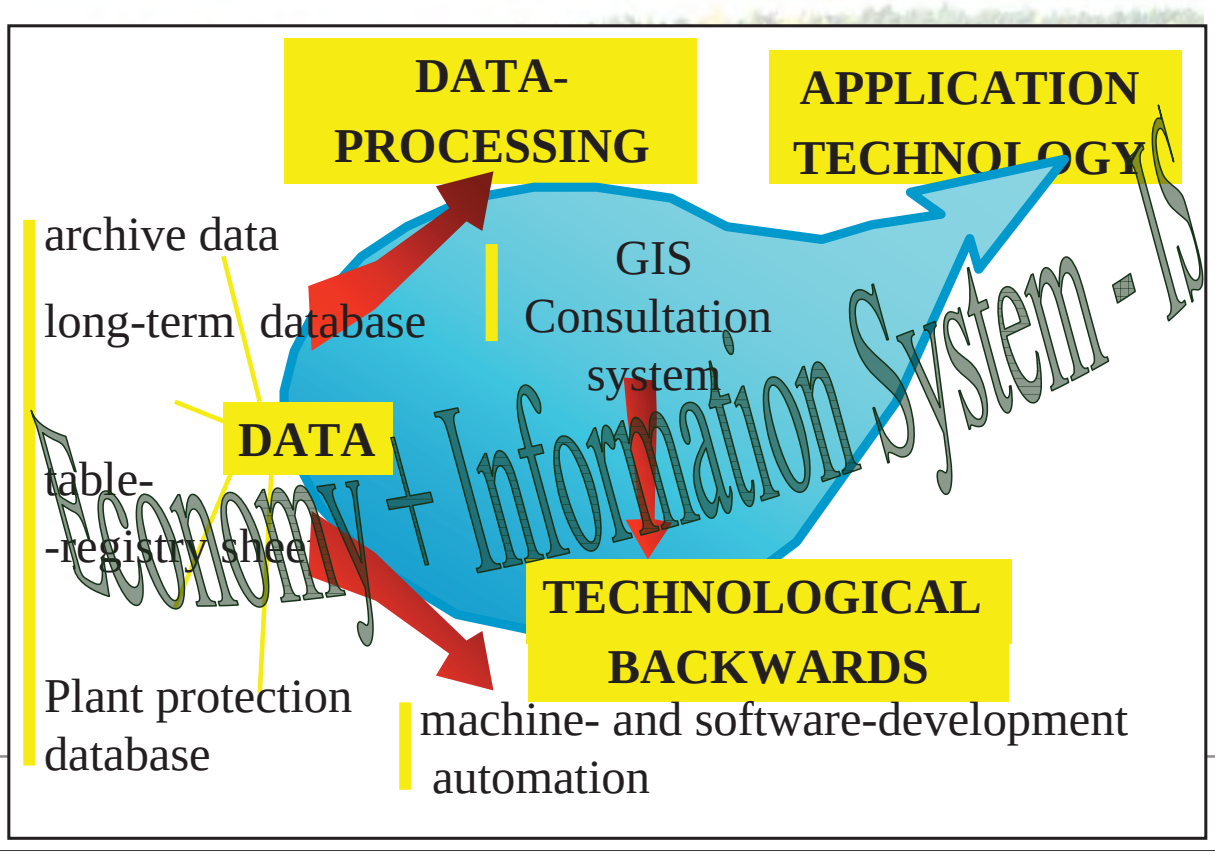
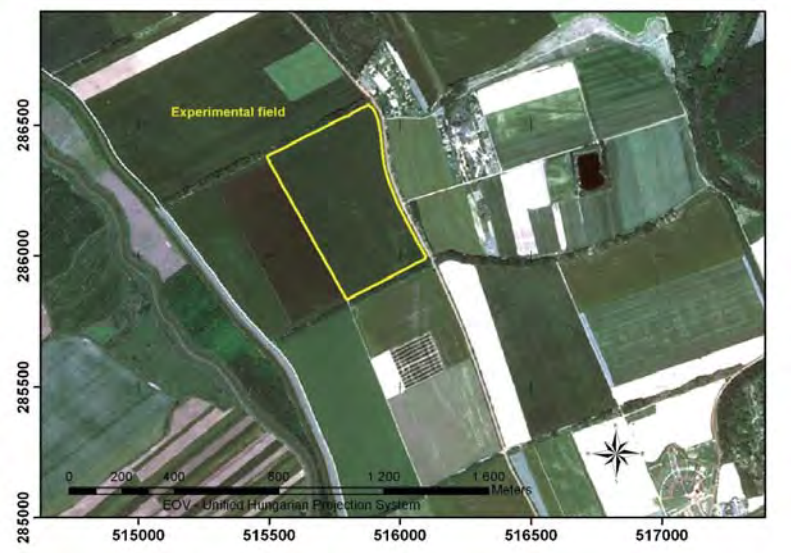
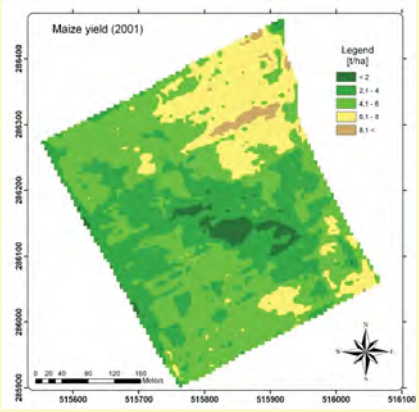
Economy + Information System

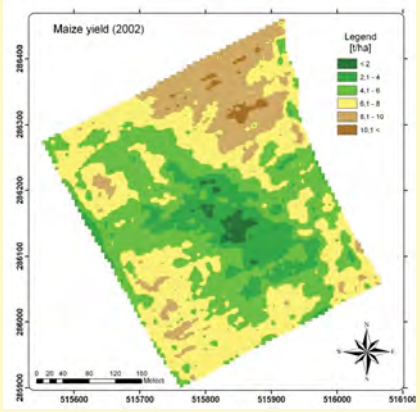


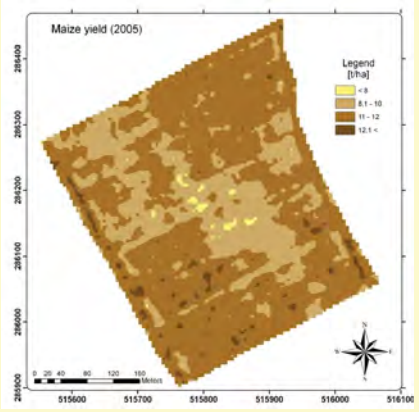
RISSAC-RIA (Research Institute for Soil Sciences and Agricultural Chemistry – Research Institute for Agronomy /Hungarian Academy of Sciences/) fertilizer recommendation system is applied since 2001 in our experimental research field near Mosonmagyaróvár, Hungary belonging to University of West Hungary.



The recommendation system – compared to earlier, rather intensive – fertilizer recommendation systems is saving cost and friendly to the environment. The fertilizer recommendations were applied between 2001 and 2006, based on an approximately 0,25 ha treatment unit size. During this time yield in the field has equalled.







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Thank you for your attention!