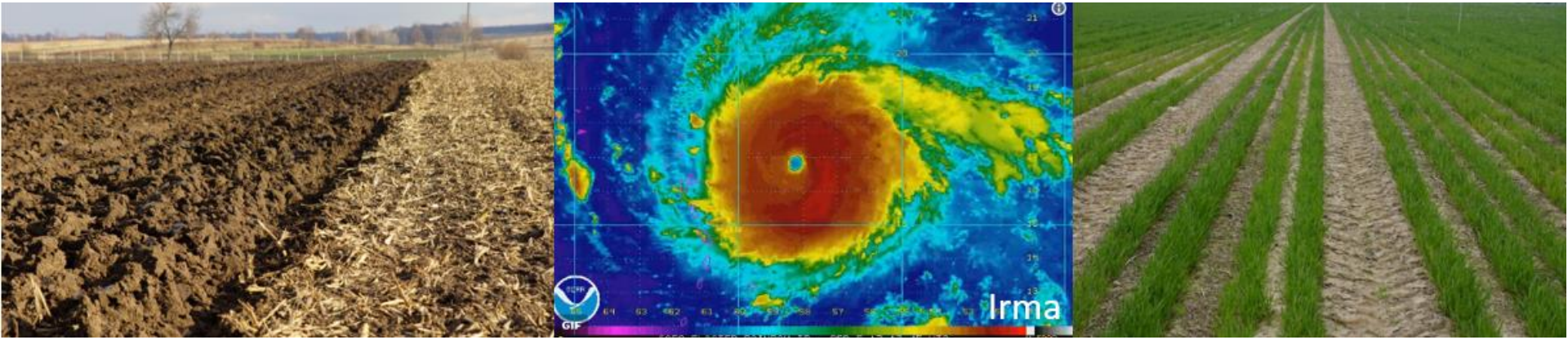

Promoting more resource efficient agricultural practices through climate smart farming - the LCAgri BioStrateg project outlook

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Institute of Soil Science and Plant Cultivation – State Research Institute (IUNG), POLAND

Warszawa, 14.11.2018

SCAR National Meeting in Poland
Examples of research projects in the area of bioeconomy in Poland

This presentation was prepared in the frame of LCAgri project BIOSTRATEG1/271322/3/NCBR/201

Instytut Uprawy Nawożenia i Gleboznawstwa

LCAgri (2016-2019)
Support for low carbon agriculture - able to adapt to observed climate change in the perspective of 2030 and 2050 (LCAgri)

The main objective of the LCAgri project
is to improve resources use efficiency
by implementing innovative low carbon farming practices
and promotion of sustainable use of mineral fertilizers
by farms in Poland

Key words: CARBON FOOTPRINT, MITIGATION AND ADAPTATION TO CLIMATE CHANGE, MODELLING, GHG EMISSION, LOW CARBON FARMING

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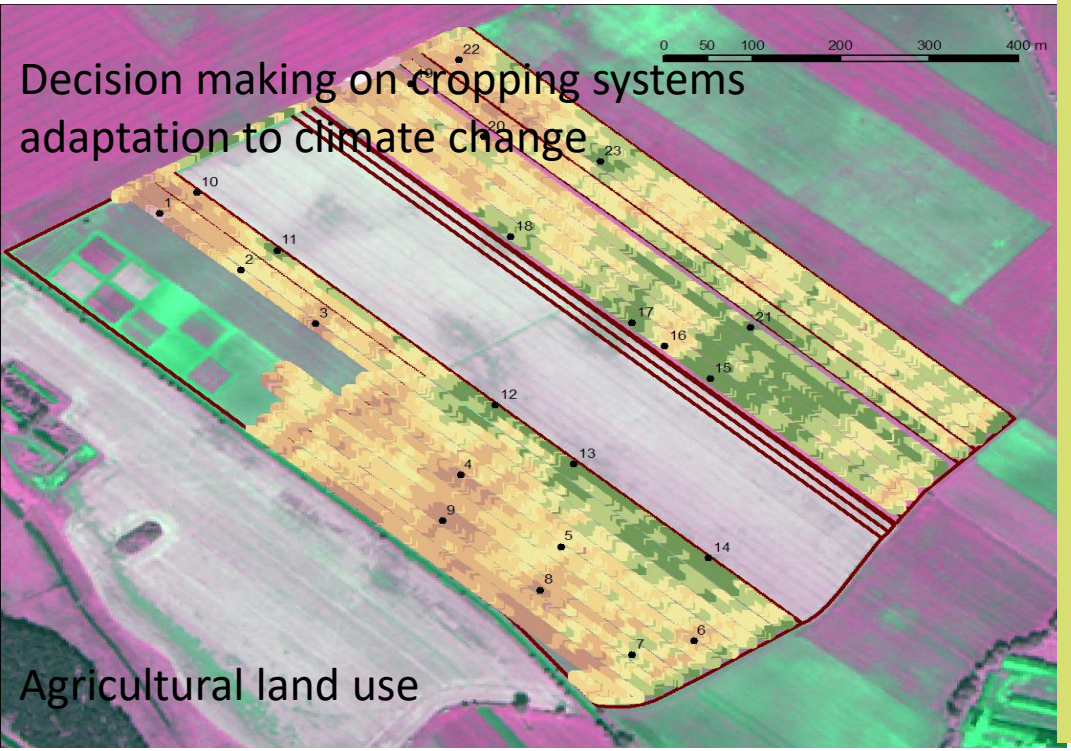
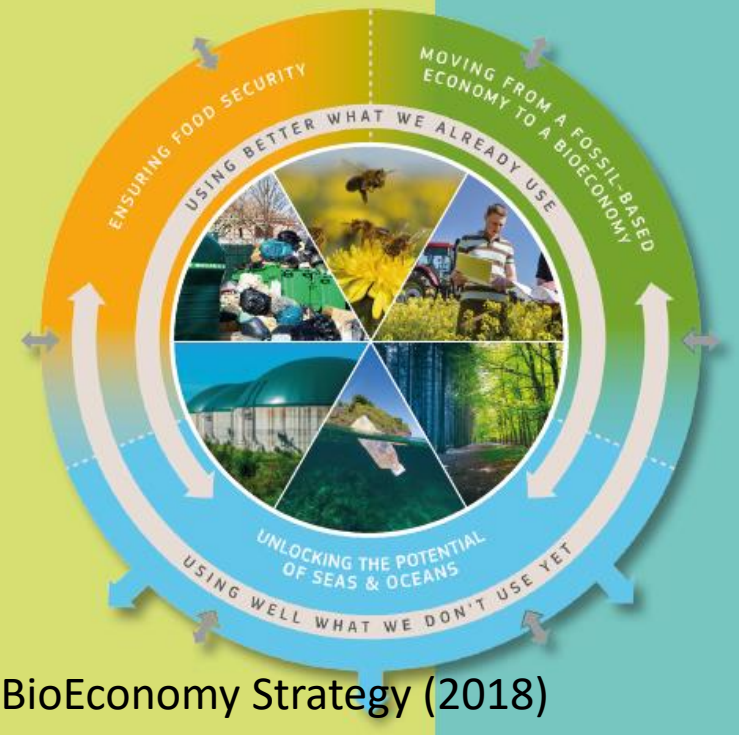
LCAgri – supports policy towards climate change adaptation in Poland

Strategic Plan for Adaptation to climate change in Poland proposed for agriculture (SPA 2013)

- Setting up local systems for monitoring and warning about approaching hazards in agriculture
- Organizational and technical changes in agriculture to avoid excessive losses by adjusting agricultural activities to the observed climate change

http://www.susza.iung.pulawy.pl/en/





Use well what we don’t use yet

Use better what we already use

LCAgri – supports policy measures towards bioeconomy development

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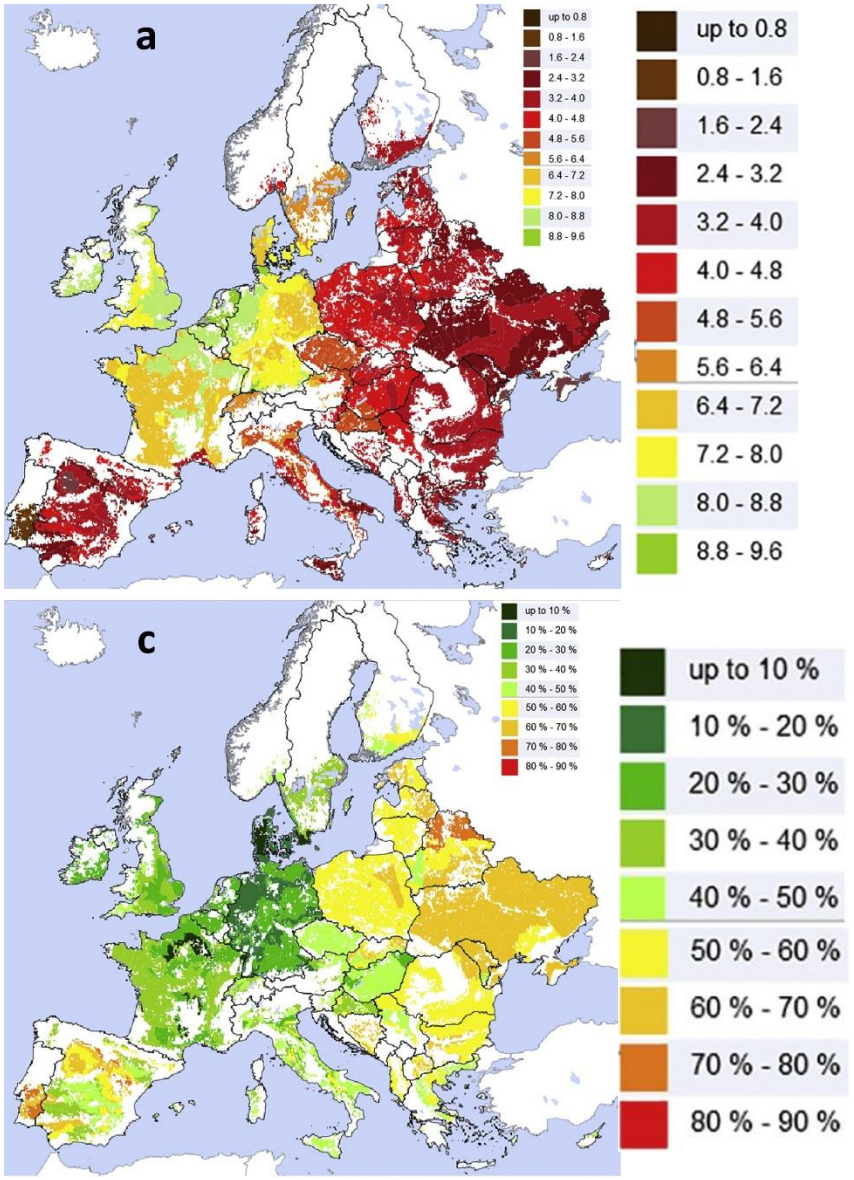
Cereal yield gaps across Europe

René Schils[a,*], Jørgen E. Olesen[b], Kurt-Christian Kersebaum[c], Bert Rijk[a], Michael Oberforster[d], Valery Kalyada[e], Maksim Khitrykau[e], Anne Gobin[f], Hristofor Kirchev[g], Vanya Manolova[g], Ivan Manolov[g], Mirek Trnka[h,i], Petr Hlavinka[i], Taru Palosuo[j], Pirjo Peltonen-Sainio[j], Lauri Jauhiainen[j], Josiane Lorgeou[k], Hélène Marrou[l], Nikos Danalatos[m], Sotirios Archontoulis[n], Nándor Fodor[o], John Spink[p], Pier Paolo Roggero[q], Simona Bassu[q], Antonio Pulina[q], Till Seehusen[r], Anne Kjersti Uhlen[r], Katarzyna Żyłowska[s], Anna Nieróbca[s], Jerzy Kozyra[s], João Vasco Silva[a], Benvindo Martins Maçãs[t], José Coutinho[t], Viorel Ion[u], Jozef Takáč[v], M. Inés Mínguez[w], Henrik Eckersten[x], Lilia Levy[y], Juan Manuel Herrera[y], Jürg Hiltbrunner[y], Oleksii Kryvobok[z], Oleksandr Kryvoshein[z], Roger Sylvester-Bradley[A], Daniel Kindred[A], Cairistiona F.E. Topp[B], Hendrik Boogaard[C], Hugo de Groot[C], Jan Peter Lesschen[D], Lenny van Bussel[a], Joost Wolf[a], Mink Zijlstra[a], Marloes P. van Loon[a], Martin K. van Ittersum[a]



Sustainable intensification is the only way to reduce yield gap in Poland = proper soil and mineral fertilizers management

Average crop yields (t ha-^{1}) and yield gaps of rainfed wheat in Europe

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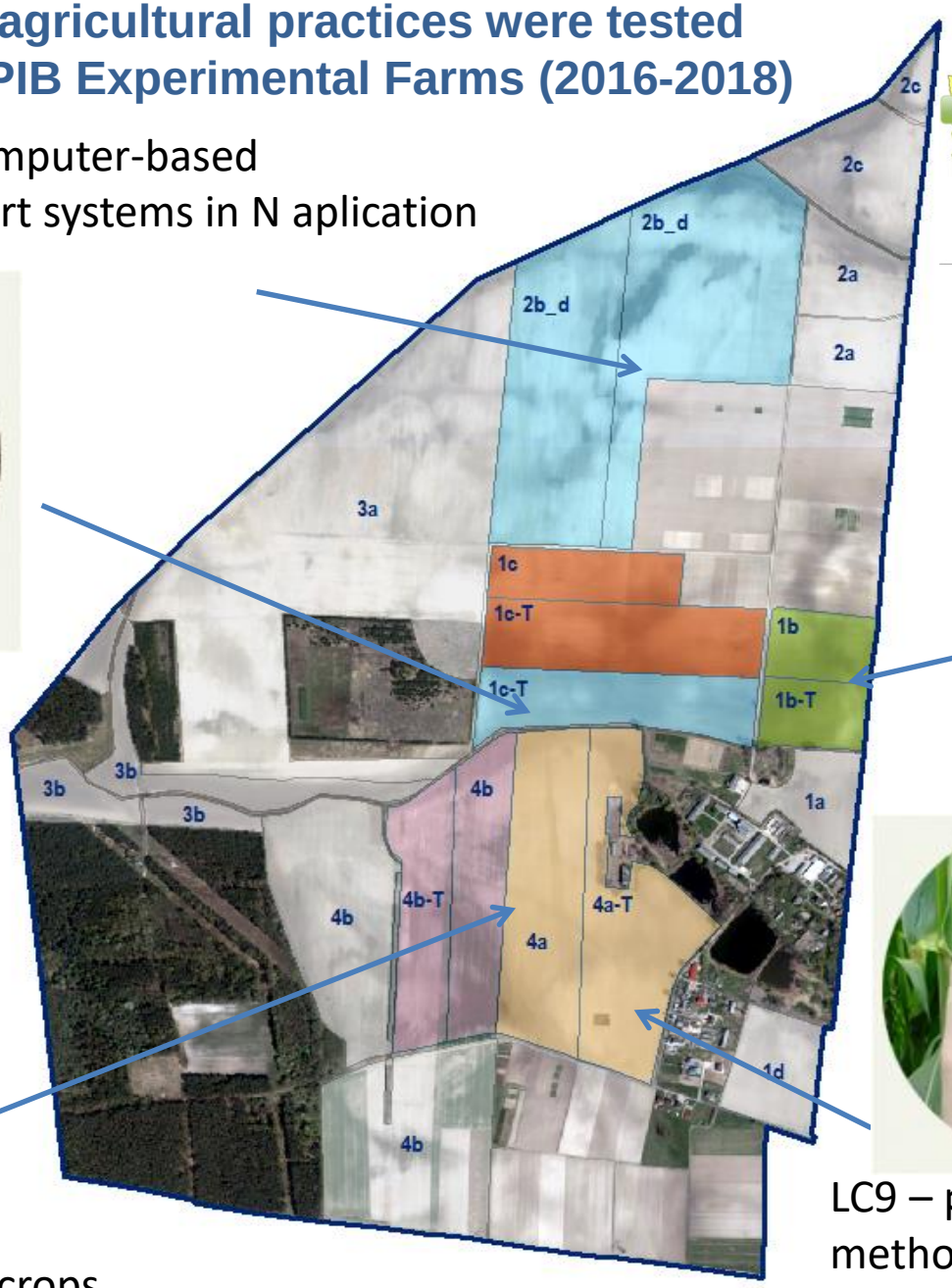
WP5

Low carbon agricultural practices were tested in eight IUNG-PIB Experimental Farms (2016-2018)

LC2 – use of computer-based decision support systems in N aplication



LC8 – Conservation agriculture (strip-till, reduced-till, cover crops)

LC1 – 4R Nutrient Stewardship

LC6 – leguminous crops

LC9 – precision farming methods

(http://www.lcagri.iung.pl/en/)

Carbon footprint - production of N fertilizers evaluation for climate smart technology

WP1

Carbon Footprint labels for Grupa Azoty fertilizers products were prepared including advice for farmers for the proper use of those products

energy

Natural gas → Ammonia

Pulan®
Pulrea®
Pulsar®
RSM®
RSMS®
PULASKA®
Pulgran®
Pulgran®S
SIARCZAN AMONU IOS

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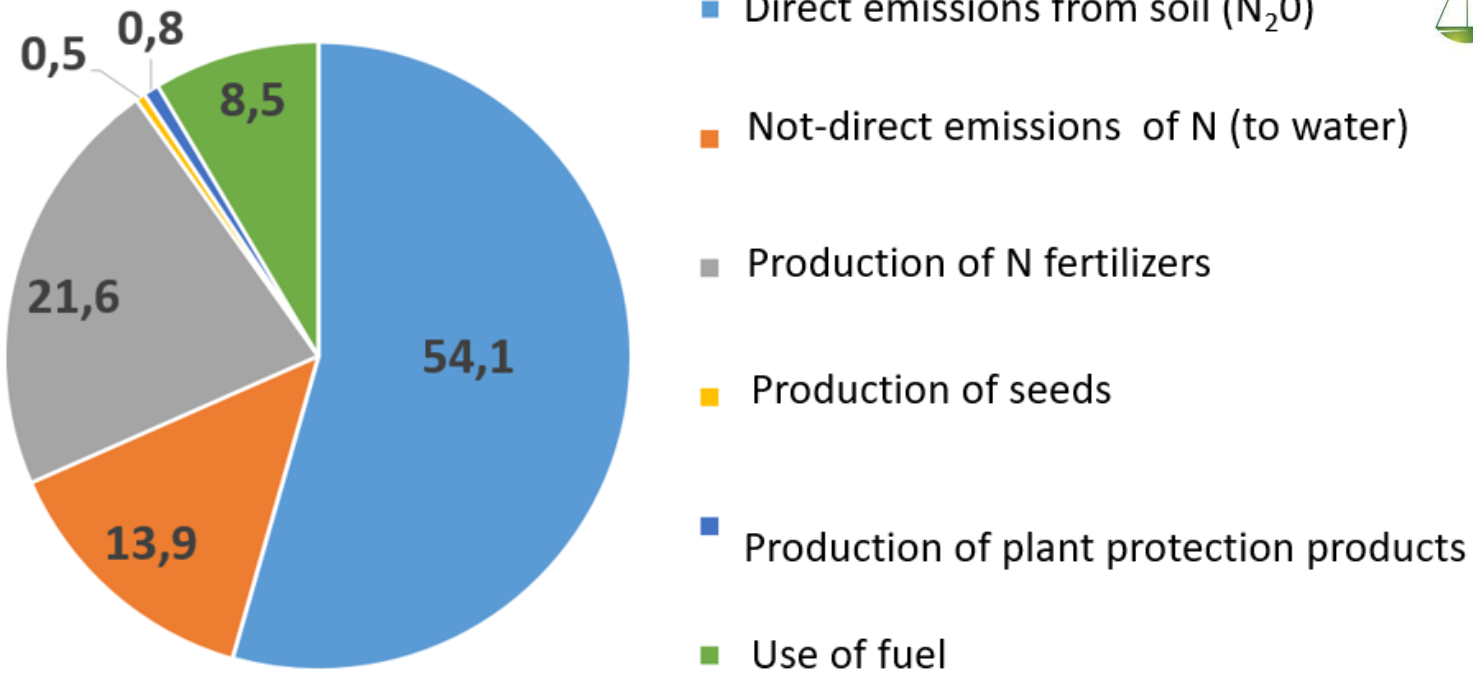
To think more „climate smart" about nutrient management

WP2



Sources of GHG emissions from maize cultivation in Poland (evaluation for 30 farms in Poland) (an example)

Source: Żyłowski T., Król A., Kozyra J., Ocena możliwości ograniczenia śladu węglowego w uprawie kukurydzy na ziarno, 2018, SERIA T.XX (4)

LCAgri – new measurement systems

WP3

11 young scientist trained , 2 utility patterns for GHG measurement

sustainability MDPI

WP5

Forthcoming Article

Evaluation of sustainability of maize cultivation in Poland. A Prospect Theory – PROMETHEE approach

Aleksandra Król , Jerzy Księżak , Elżbieta Kubińska and Stelios Rozakis

Ranking of agricultural practices in maize cultivation in Poland using multi-criteria evaluation by means of Prospect theory –PROMETHEE method

Criteria considered are: (1) expected gross margin (2) standard deviation of gross margin, (3) fuel consumption (4) labour use in hours, (5) soil moisture and (6) organic matter in soil.

Decision maker / Option	Small farm	Big farm	According to agricultural experts
Direct sowing	3	1	2
Reduced tillage	2	2	3
Traditional ploughing	1	3	1

www.lcagri.iung.pulawy.pl

Learning by experience

WP5

Field discussion between scientist and farm manager where to locate experimental fields

Reduced tillage

Conservation agriculture
Strip-till

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Osiny Experimental Farm - Learning by experience WP5

Winter wheat after rape cultivation- Conservation agriculture (strip-till)

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BIOSTRATEG

Osiny Experimental Farm

WP5

Rape- Conservation agriculture (strip-till)

Fot. dr Anna Nieróbca

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Osiny Experimental Farm

WP5

Winter wheat - Conservation agriculture (strip-till)

Fot. dr Anna Nieróbca

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Osiny Experimental Farm

WP5

Winter wheat after rape cultivation- Conservation agriculture (strip-till)

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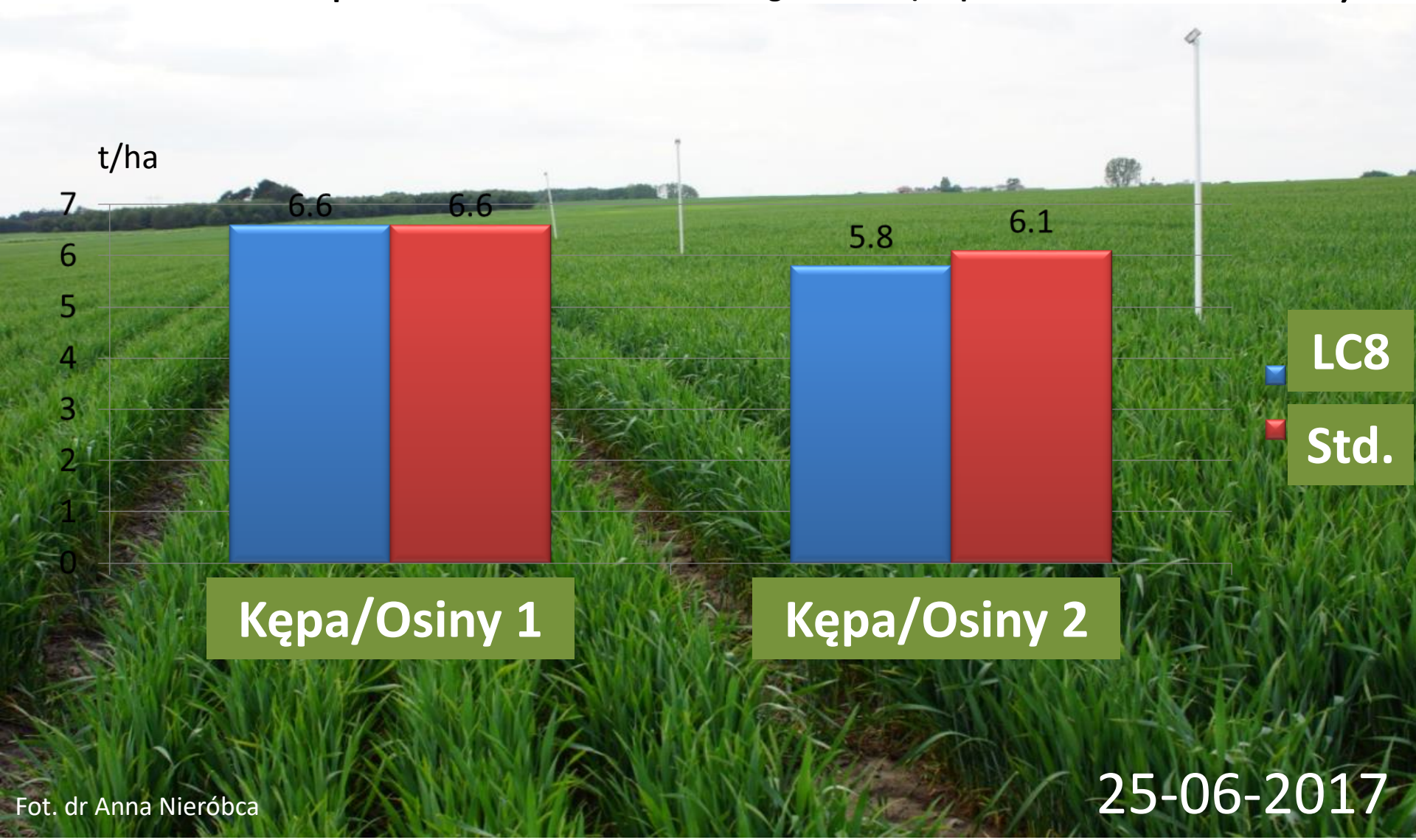
BIOSTRATEG

Osiny Experimental Farm – YIELD LEVEL

WP5

Winter wheat after rape cultivation- Conservation agriculture (strip-till – LC8, reduced till – Std.)



Fot. dr Anna Nieróbca

25-06-2017

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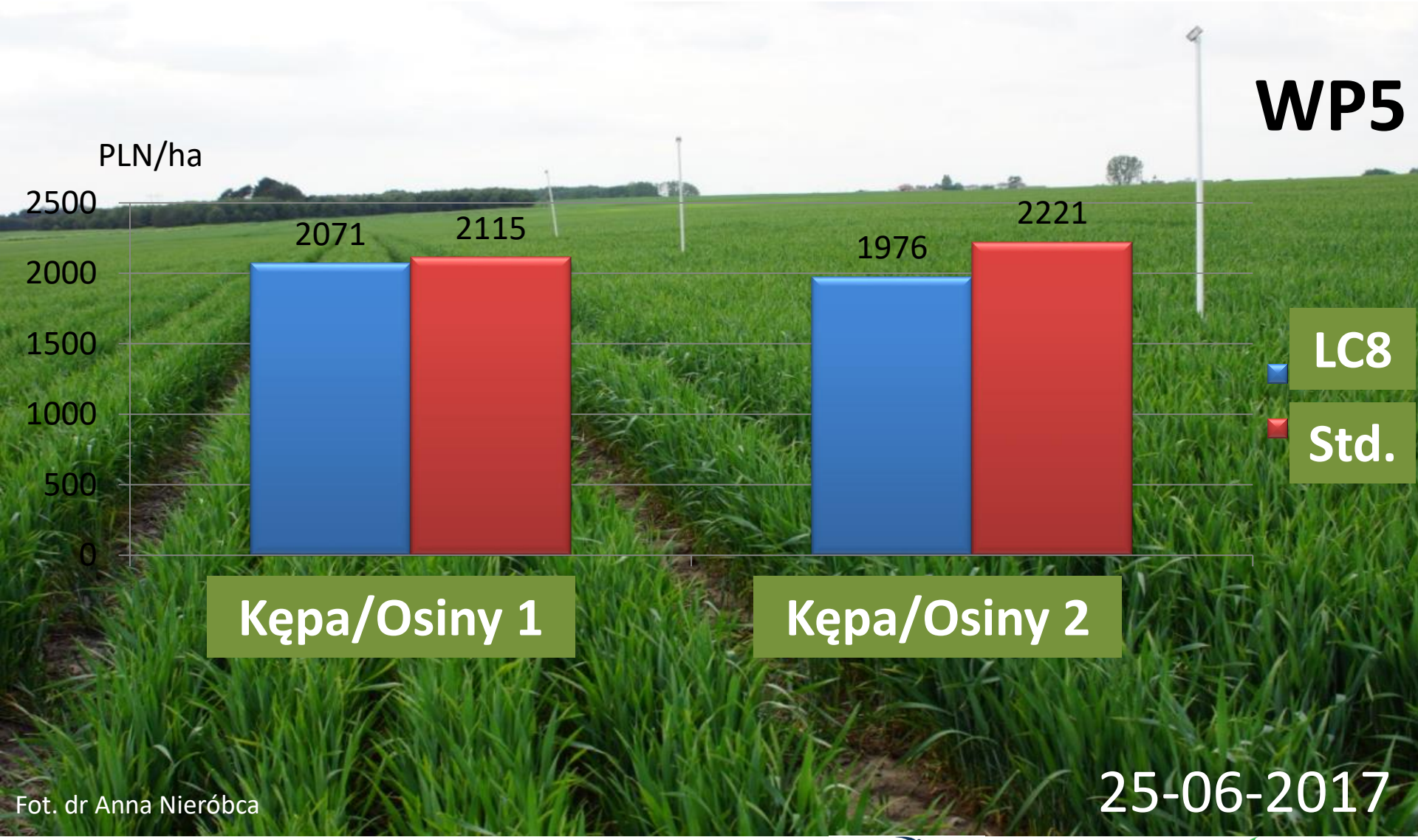
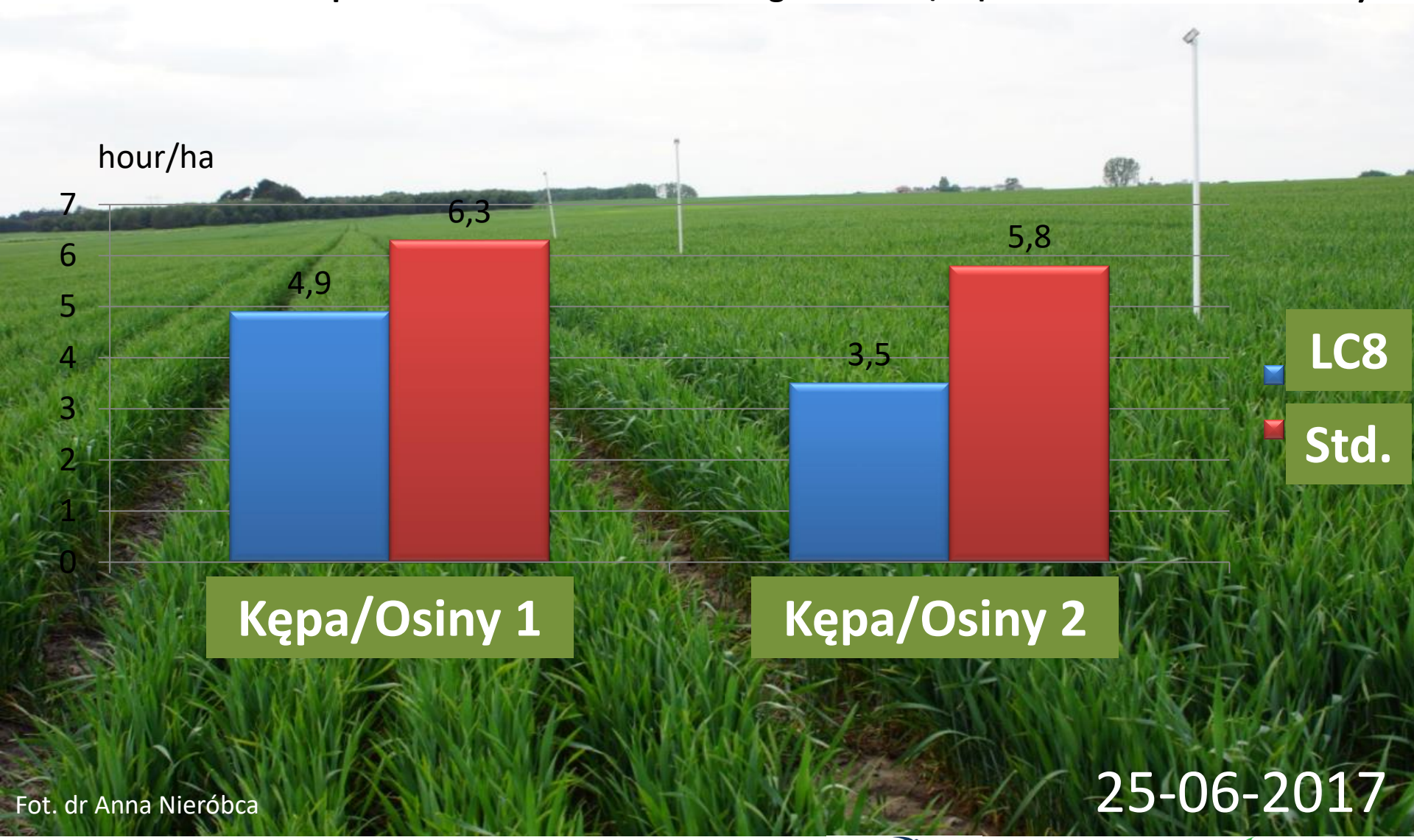
Osiny Experimental Farm – PRODUCTION COST (2017)

Winter wheat after rape cultivation- Conservation agriculture (strip-till – LC8, reduced till – Std.)



Osiny Experimental Farm – MACHINE WORK HOURS (2017)

Winter wheat after rape cultivation- Conservation agriculture (strip-till – LC8, reduced till – Std.)



Fot. dr Anna Nieróbca

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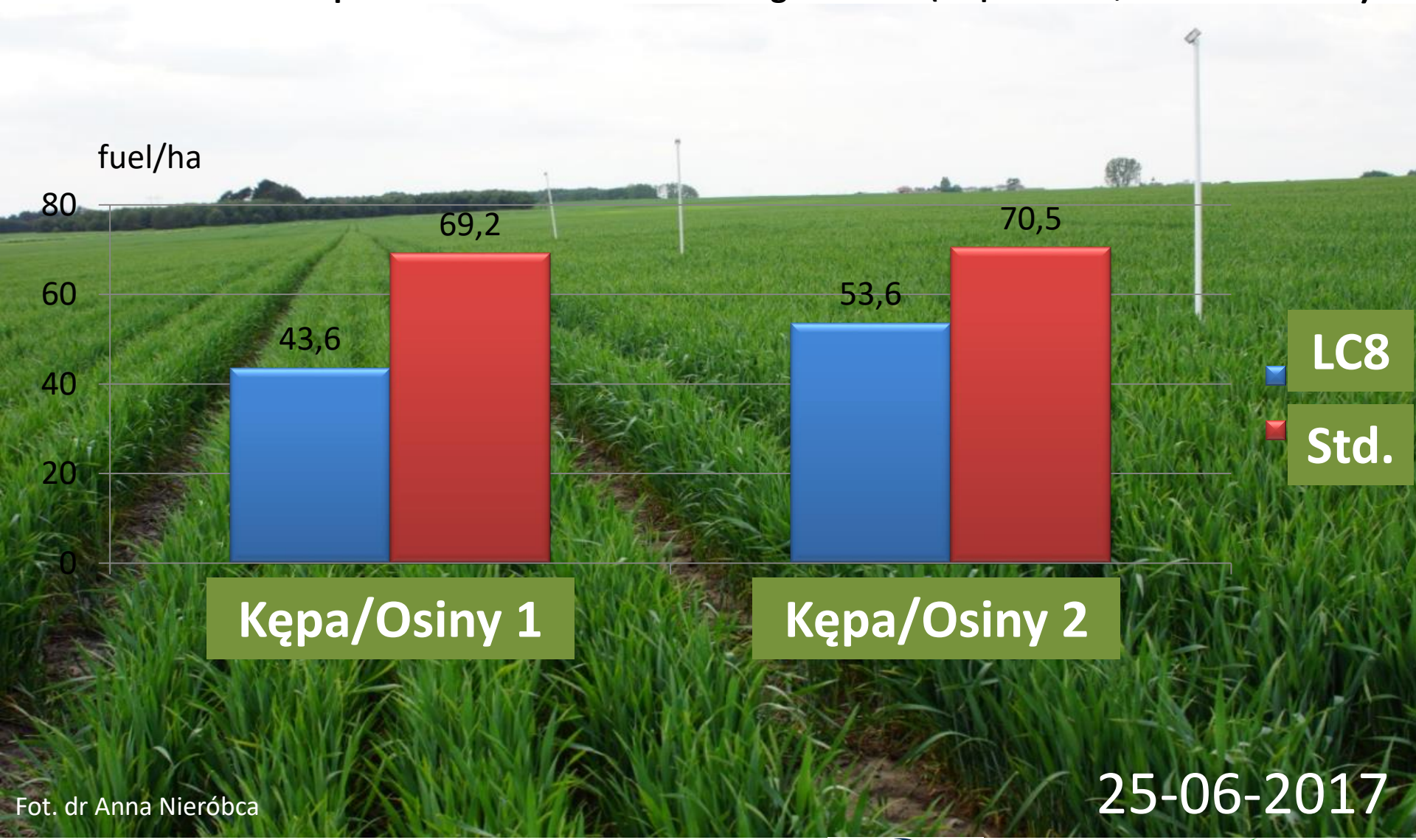
Osiny Experimental Farm – USE of FUEL (2017)

WP5

Winter wheat after rape cultivation- Conservation agriculture (strip-till – LC8, reduced till – Std.)



Fot. dr Anna Nieróbca

25-06-2017

Instytut Uprawy Nawożenia i Gleboznawstwa

Networking

WP6

1166 participants in field LCAgri days and workshops

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