Agricultural Engineering and Climatic Responsibility?

Initiative for a holistic approach to reduce CO₂ emissions from agricultural mechanization processes.
Our society has to react…

...Agricultural Engineering as part of our society has to accept responsibility.

Future legislation initiatives will focus most likely on reduction of CO₂ and other greenhouse gases.

Construction and agricultural machinery are only a minor contributor to total emissions from transport.

1 litre of Diesel converts into 2.65 kg CO₂.
Reduction of CO$_2$-emissions = minimize engine-emissions?

- Bearings?
- Transmission?
- Drivetrain?
- Tire inflation?
- Knife sharpening?
- Corn Cracker-efficiency?
- ...

Process efficiency and CO$_2$ emissions

Machines in agriculture may be optimized individually. However, they are not working independently from each other.
Process efficiency and CO₂ emissions

- Tractors do emit CO₂
- However, the very reason is the job of the implement behind, or the combination of tractor and implement

- All components in a mechanization chain are relevant - not just engine carrying vehicles

CO₂-Strategy of the Agricultural Machinery sector
Market-based approach instead of regulatory approach by

Potential of agritechnological process chains for efficient use of fuel

Machine Efficiency
Optimizing Engine Gearboxes Hydraulics Threshing drum Tires etc.

Process Efficiency
Selection of optimal machine combinations for a process
Optimal tuning of the individual process steps to each other

Operation Efficiency
Training and education of users
Understanding and adaptation to local needs of a specific agricultural area

Alternative Energy sources
Use of renewable fuel and lubricants
Introduction of alternative drive concepts

Use the innovative power of competition to achieve solutions with the highest efficiency
Target: Voluntary Commitment to reduce CO\(_2\) emissions from Agricultural Machinery

Joint research project
EKoTech

„Effiziente Kraftstoffnutzung in der AgrarTechnik“
“Efficient fuel use in agricultural Technology”

VDMA CO\(_2\) Project EKoTech
System boundaries

- Definition of model farms in 7 countries
- 3 crops to cover about 80 %
  of the agricultural area in EU 28
**APPROACH**

**Typical Farms**

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**APPROACH**

Reference parameter

Fuel consumption / production unit [l/GE]

Focus purely on machinery use

NOT a total life cycle approach
From Joint Research Project to voluntary self-commitment

BLE EKoTech joint research project

Expanding the approach to a European Level

Preparation of a voluntary self-commitment.

Big is Beautiful", but...
intelligent optimization of mechanization chains may offer more efficiency potential
Precision Steering by GPS is only a first step…

...in Australia farmers are dedicated to Controlled Traffic Farming

Very precise satellite positioning allows for an exact duplication of working paths over years

Farming 4.0
New efficiency by solutions derived from a digitalization of all elements influencing production
Farming 4.0
New technologies may even be disruptive
…we have to insure, that they contribute to clima-efficiency as well

EKoTech
Let’s take responsibility - together

How far would we like to grant to our great-grand children that they may live as good as we are living today
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