

Higher maize yield when using VF-tires



Promilleafgiftsfonden for landbrug

Henning Sjørsløv Lyngvig

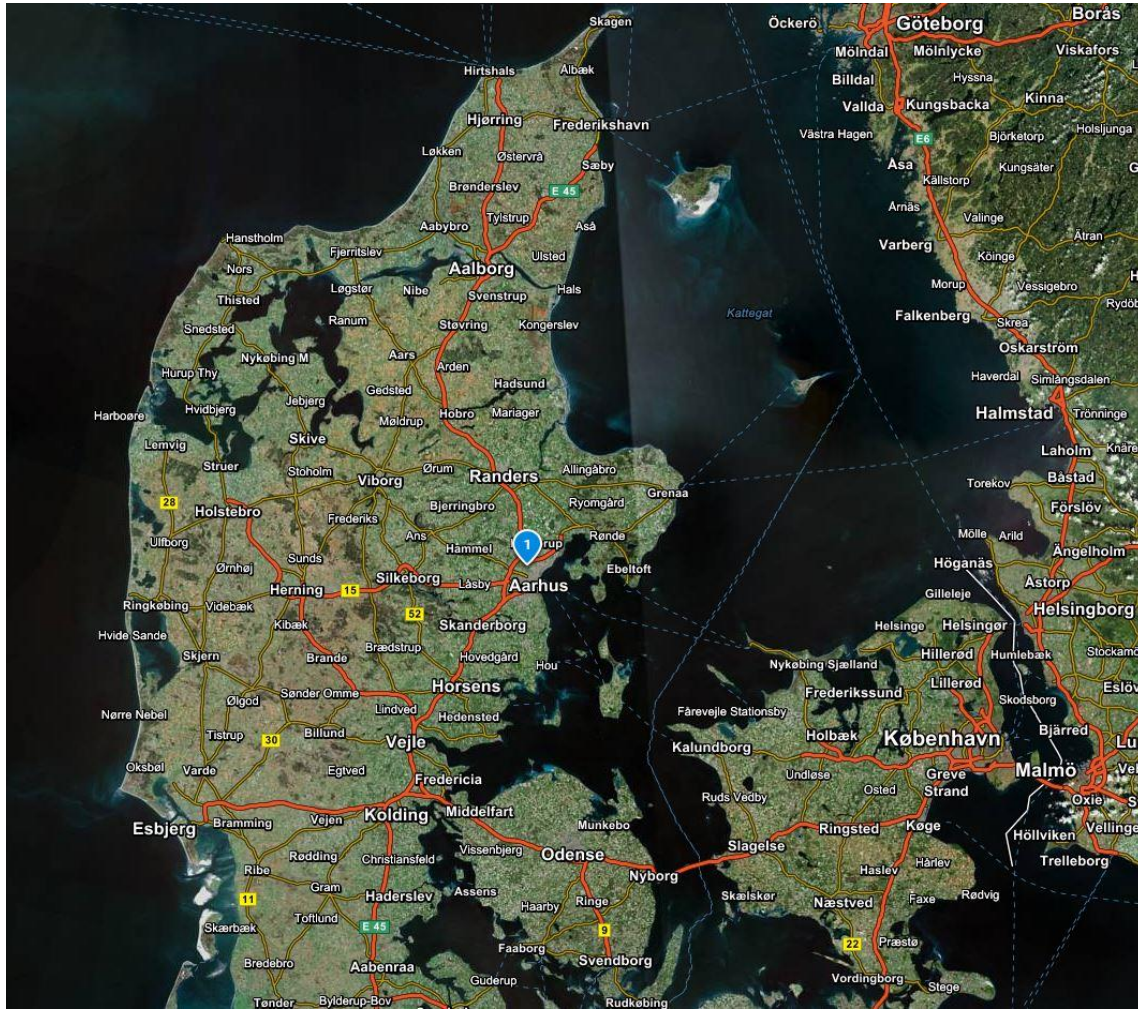
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How to find SEGES Innovation

- ✓ Located near Aarhus in Denmark – Agro Food Park
- ✓ Owned by the Danish Farmers



www.seges.dk

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What is SEGES Innovation

- ✓ I have approx. 500 colleges specialized in crops, soil, fertilizers, plant-protection, environment, precision farming, IT solutions etc.
- ✓ My field of work is machinery for farming + drying / storage of crops
 - heavy machinery make tires essential to minimize soil compaction / loss of yield
- ✓ A number of Field Trails every year – mine concerning machinery



Wheel load for standard 27 m³ slurry tanker in Denmark

– using a 400 hp tractor (Fendt 939) + 12 row incorporater (Horsch Focus CS)

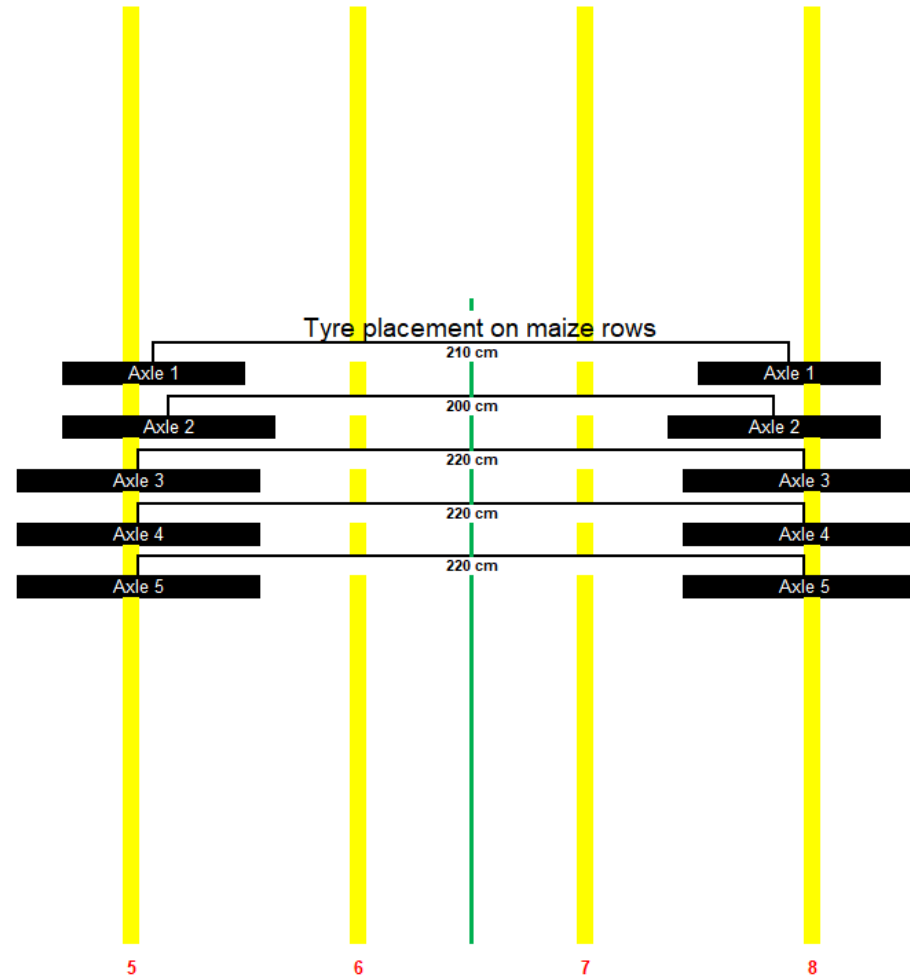


Foto: Henning Sjørslev Lyngvig, SEGES

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Soil compaction when placing slurry before maize

➔ in plowed soil



Field Trail – Tyre-types using different pressure

Two tyre types with two tyre pressures:

1) Standard tires – using the contractors tyre pressure

Axle 1	Tractor front	600/70R34
Axle 2	Tractor rear	710/75R42
Axle 3	Slurry tanker front	800/60R34
Axle 4	Slurry tanker center	800/60R34
Axle 5	Slurry tanker rear	800/60R34

Contractors tyre pressure with standard tires



Foto: Henning Sjørsløv Lyngvig, SEGES

Field Trail – Tyre-types using different pressure

Two tyre types with two tyre pressures:

2) VF-tires – tyre pressure optimized to field conditions:

Axle 1	Alliance Agriflex 372+	VF600/70R34
Axle 2	Alliance Agriflex 372+	VF710/75R42
Axle 3	Alliance Agriflex 389+	VF800/60R32
Axle 4	Alliance Agriflex 389+	VF800/60R32
Axle 5	Alliance Agriflex 389+	VF800/60R32

VF-tires – tyre pressure optimized to field conditions

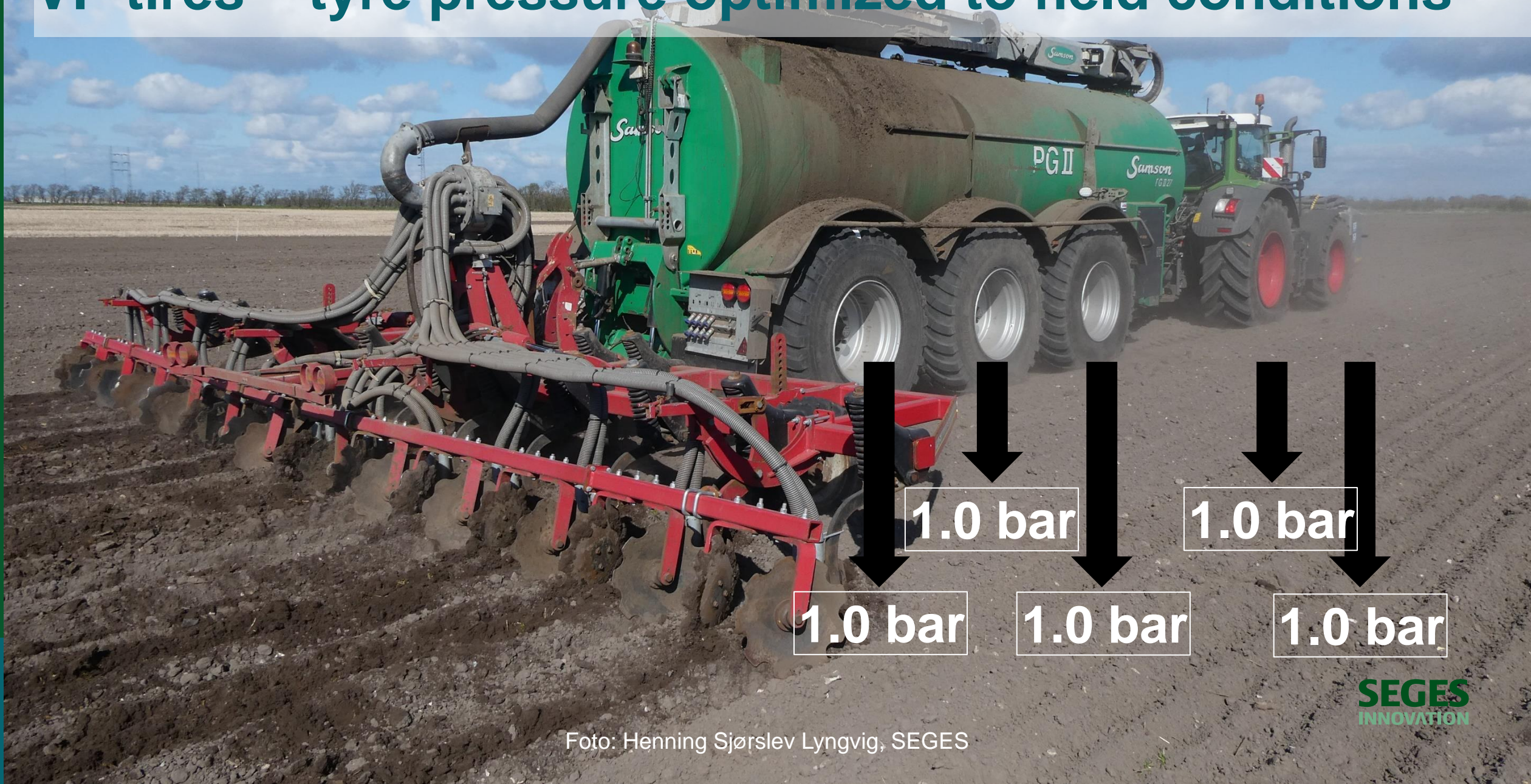


Foto: Henning Sjørsløv Lyngvig, SEGES

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Tires as a mean to reduce soil compaction

- The tyre pressure can reduce soil compaction in top soil [till 30 cm]
 - Below the top soil wheel load matter the most
- Standard tires can also optimize tyre pressure
- But VF-tires are constructed for 40% less tyre pressure

Tires delivered by **NDI** for

YOKOHAMA
Off-Highway Tires

- Tractor tires: Alliance VF372+

ALLIANCE



Foto: Claus Solhøj, LM

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Tires delivered by **NDI** for

YOKOHAMA
Off-Highway Tires

- Slurry tanker tires: Alliance VF389+

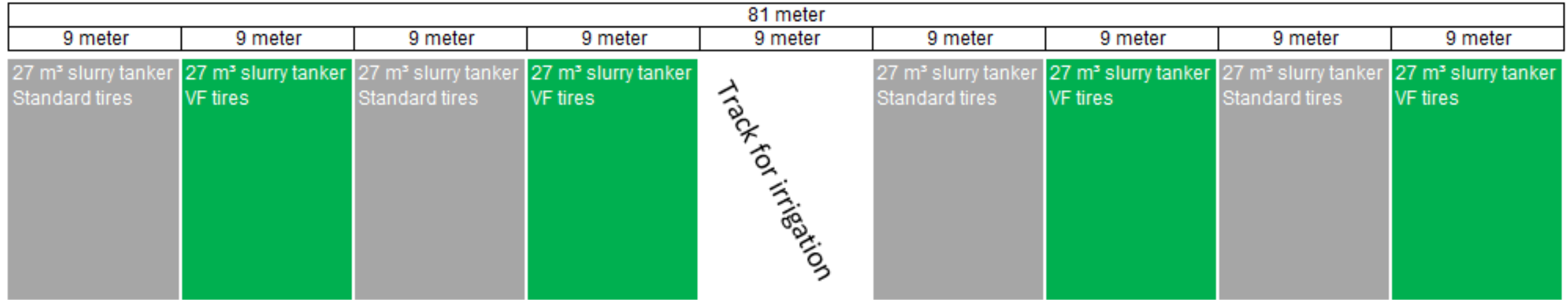
ALLIANCE



Foto: Henning Sjørslev Lyngvig, SEGES

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Field Trail setup



Yield measurement:

- Each maize-row harvested separate, to measure the yield difference for the tyre-types.
- Slurry placement depth was measured for every maize-row, to measure the difference in yield caused by different placement depth.

Field Trail setup in the field



Tires were changed



Wheel-load Measurement

– to achieve correct tyre pressure



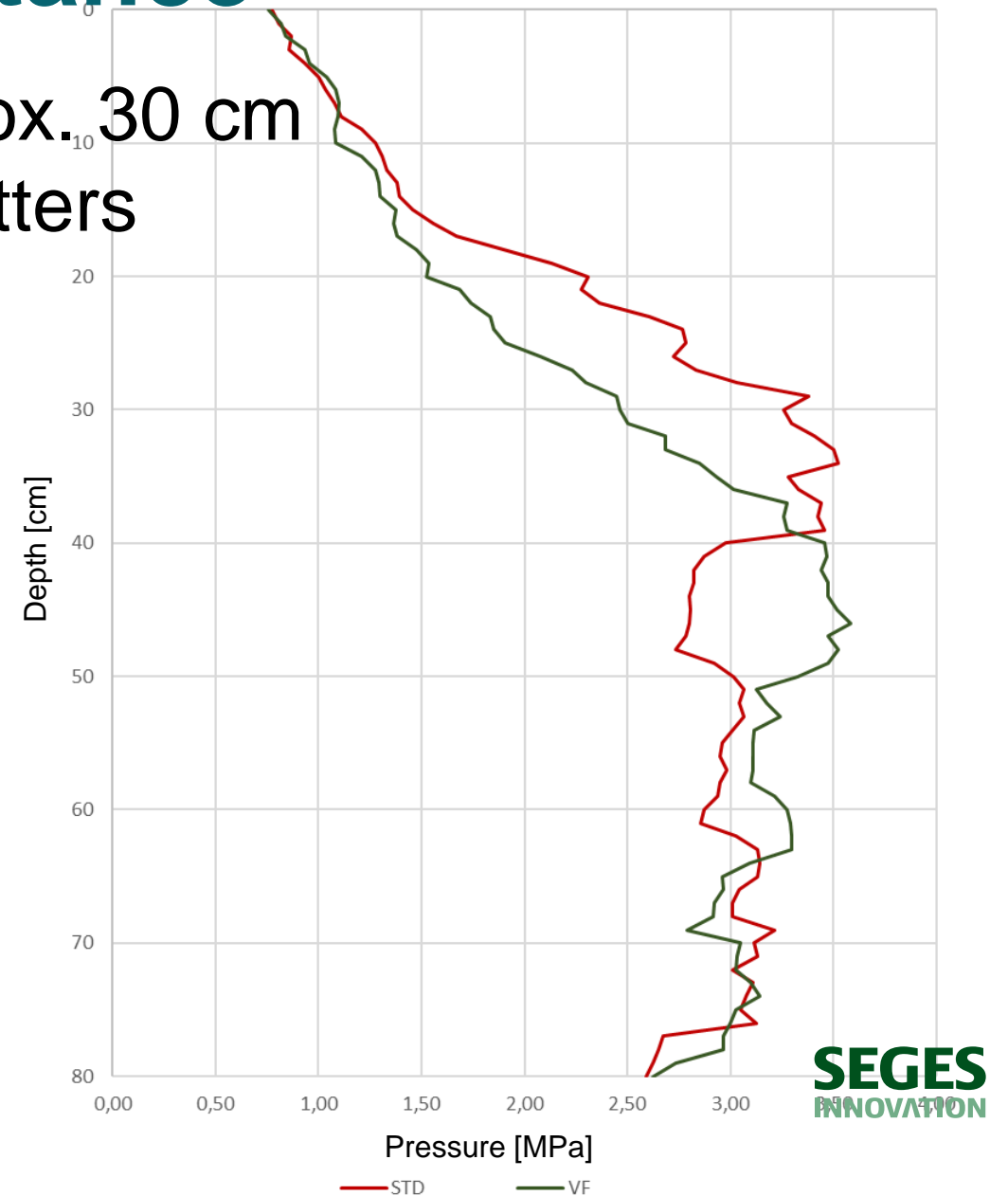
Measurement of soil compaction

Using a Penetrologger



Measurement of soil resistance

- Tires and pressure matters till approx. 30 cm
- Below 30 cm wheel load mostly matters
- I have consulted Aarhus University concerning the skift at 40 cm
 - AU have seen this before, but have no explanation.



Measurement of track depth and wheel slip

- When using VF-tires track depth was reduced by approx. 50%
- Wheel slip was reduced by 4.4% – indicating less traction



Foto: Claus Solhøj, LM

Fotos from the day we seeded the maize

– VF-tires and low pressure resulted in better drainage



Standard-tires, high tire pressure



VF-tires, low tire pressure

Foto: Martin Mikkelsen, SEGES

Measurement of yield and quality

Each maize-row was harvested separate, to measure any difference in yield and quality for the two tyre-types.



Harvest results – yield and quality

Maize row, in/off track	Tyre type		Traffic in the row	Plants per m2	Plant height Juli 9th, cm	Plant height Oct. 4th, cm	Dry matter, %	Starch g/kg DM	NEL20 MJ/kg DM	Yield per hectare	
										hkg DM	crop units

2021. 1 forsøg

Traffic in the row - STD			+	8,0	93	243	33,0	301	6,55	141,3	124,6
Traffic in the row - VF			+	8,2	95	241	32,3	289	6,55	156,1	137,5

- VF-tires, low tyre pressure: +10,4% yield in track (significant)
- Converted to 12 rows (full width) approx. +2% yield increase
- Equivalent to 35 euro per hectares

Under very dry conditions in the spring 2021
The potential might be greater under wet conditions



Thanks for attending

Foto: Henning Sjørslev Lyngvig, SEGES