



Residual straw as energy source – Agronomic aspects

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Straw as renewable raw material

No fuel vs. feed discussion,

Various ways to process (fuel or bioplastics)

Problematic due to threatened humus balance

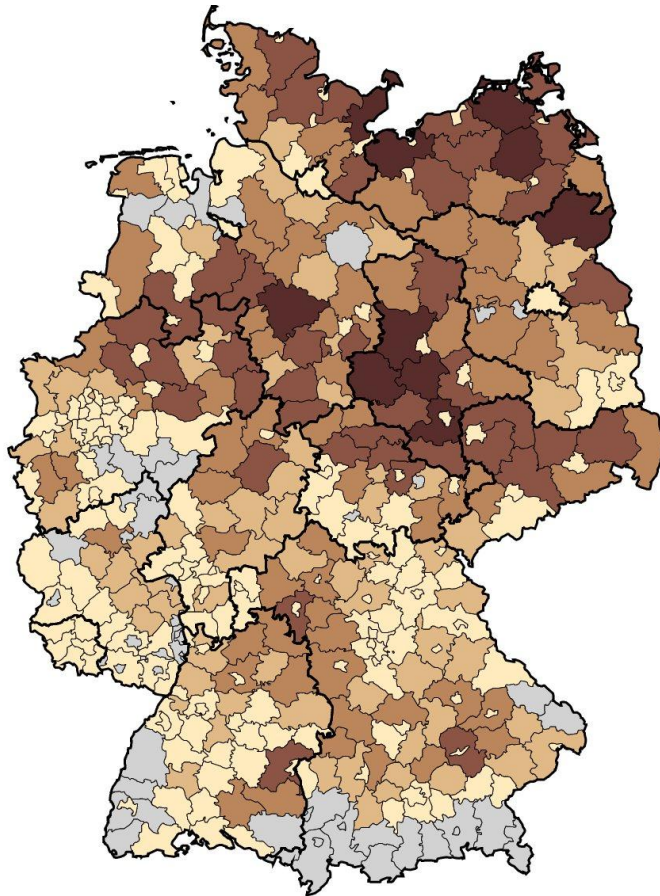
Straw is not a residue, it is valuable raw material for energetic use and bioplastics.

Furthermore it is the only way to maintain healthy humus balances in intensive cereal rotations.

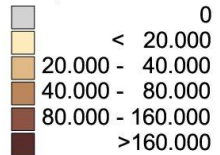
But: „How much straw can we actually harvest from the field und how much real residues are left to balance the humus content?“

Straw potential VDLUFA

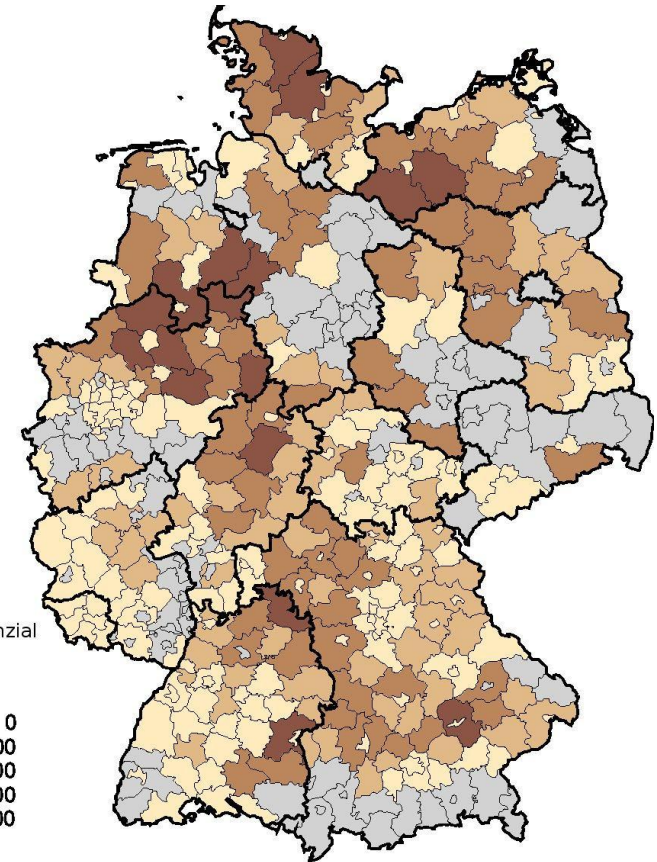
Straw potential dynamic humus units method



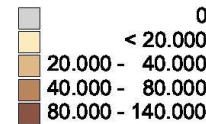
Getreidestrohpotenzial
nach VDLUFA (2004)
untere Werte/ Cross
Compliance [t] FM



100 0 100 200 Kilometer



Getreidestrohpotenzial
dynamische HE-
Methode [t] FM



100 0 100 200 Kilometer

Quelle: C. Weiser et al., 2010

Field scale experiment

„What influence have variety, harvest technology, and fungicide treatment on the harvestable amount of straw and of the residues on the field?“

15 ha trial with Claas and Bayer Cropscience in Hovedissen, NRW at W. Borries-Eckendorf GmbH

6 different winterwheat and 1 triticale variety

2 fungicide treatment (opt. / red.)

2 harvest dates

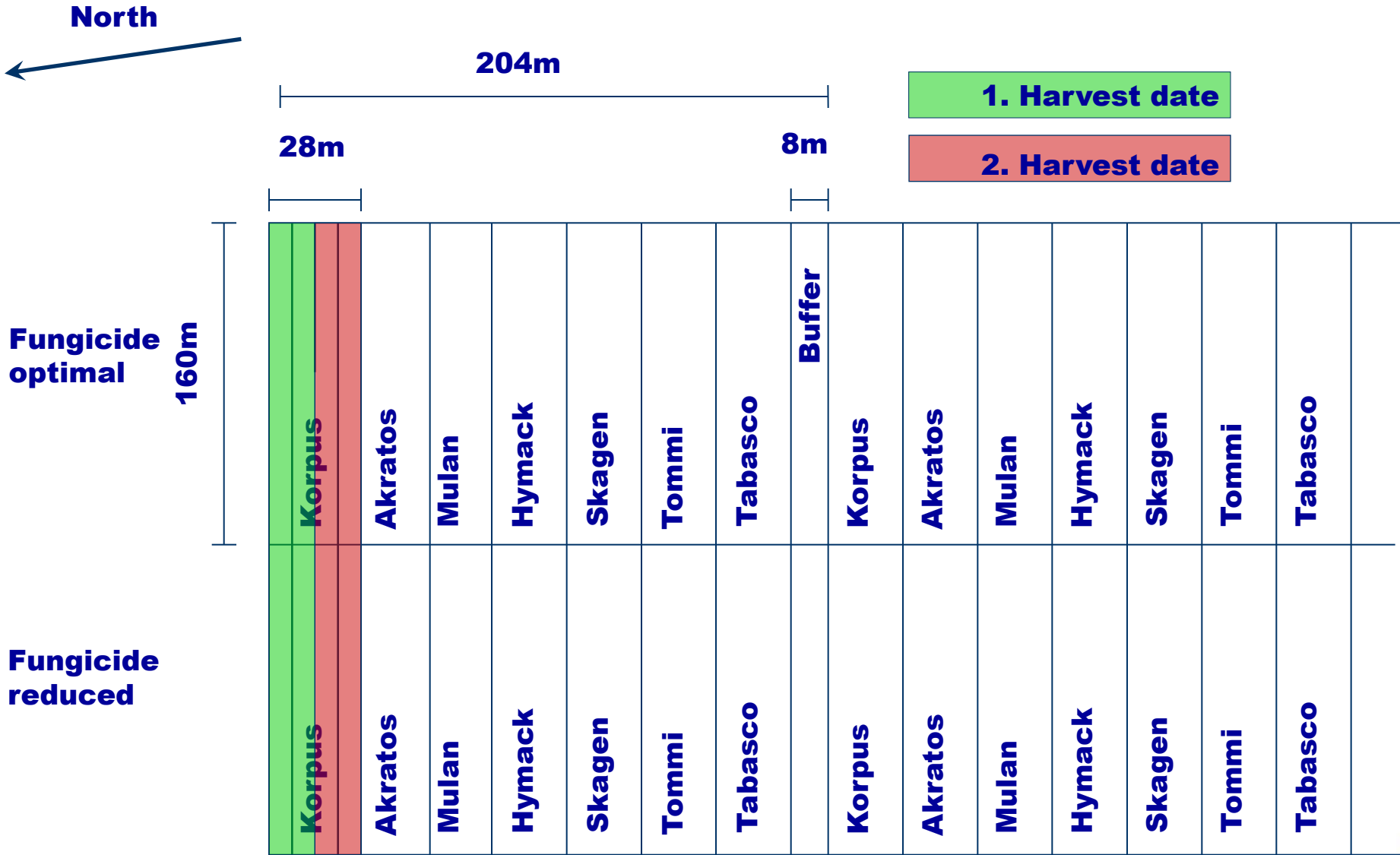
Different velocities during harvest (2,5 / 3,5 / 4,5 / 5,5 km/h)



Trial field Hovedissen, 2009 (320 x 450 m)



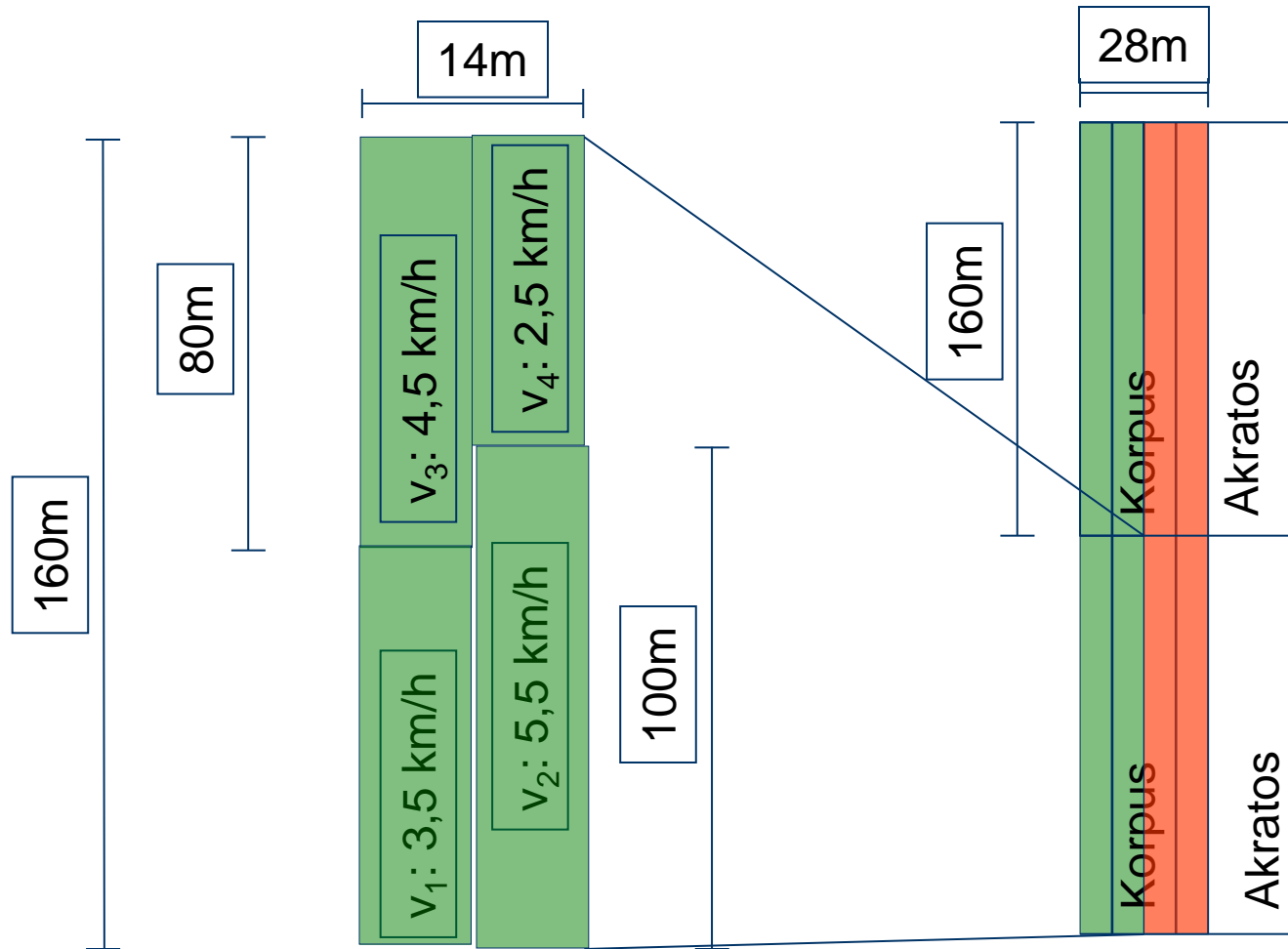
Design Straw field trial



Road „L968“

Velocities

- Lexion 570, 6m combine
- 4 different velocities with each variety, fungicide treatment at both harvest dates



Treatments

Date	Treatment	Optimal long	Optimal short	Reduced long	Reduced short
15.04.09	CCC	1,2	0,8	1,2	0,8
02.05.09	CCC	0,5	0,3	0,5	0,3
	Moddus	0,2	0,14	0,2	0,14
	Input	1	1		
	Tallius	0,2	0,2		
18.05.09	Moddus	0,15	0,1	0,15	0,1
	Input	0,75	0,75	0,75	0,75
	Fandango	0,75	0,75	0,75	0,75
	Karate Zeon	0,075	0,075	0,075	0,075
05.06.09	Prosaro	1	1		
	Sumicidin	0,2	0,2	0,2	0,2

2 harvest dates

Drilling 14.10.08



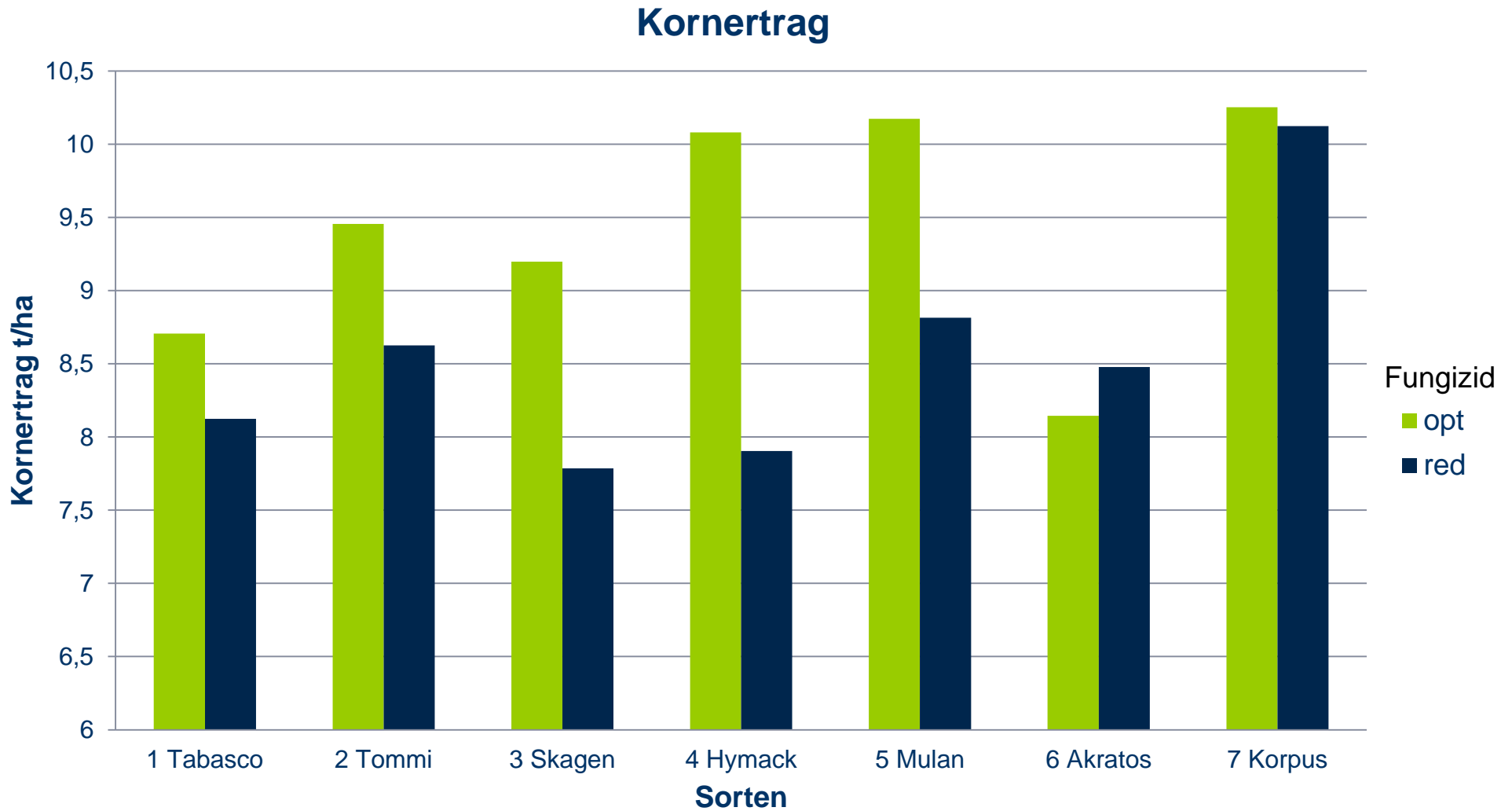
Measurement of grain yield, straw yield and residues



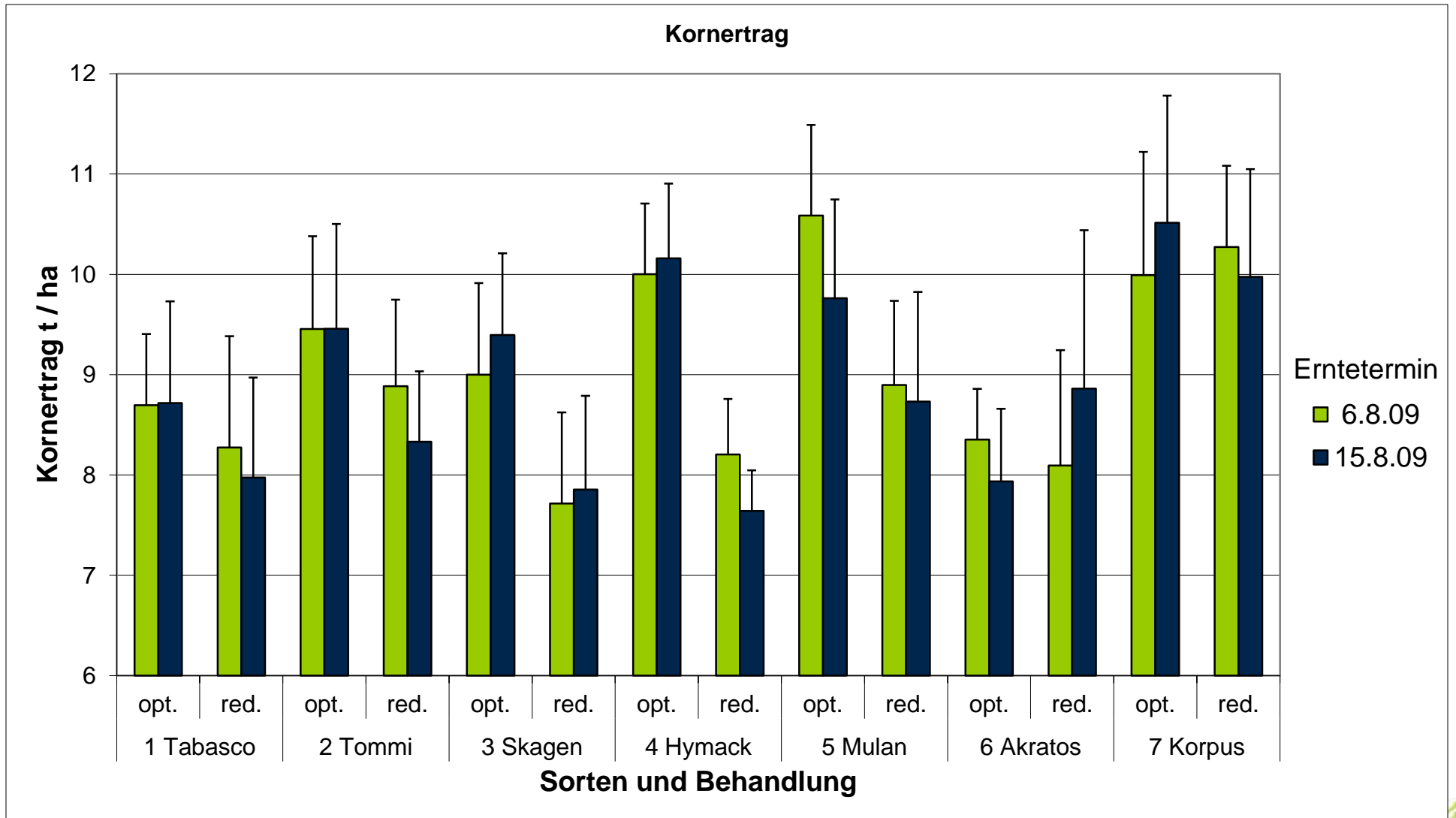
Combine



Grain yields (Impact of fungicide)



Grain yields (no impact of harvest dates)

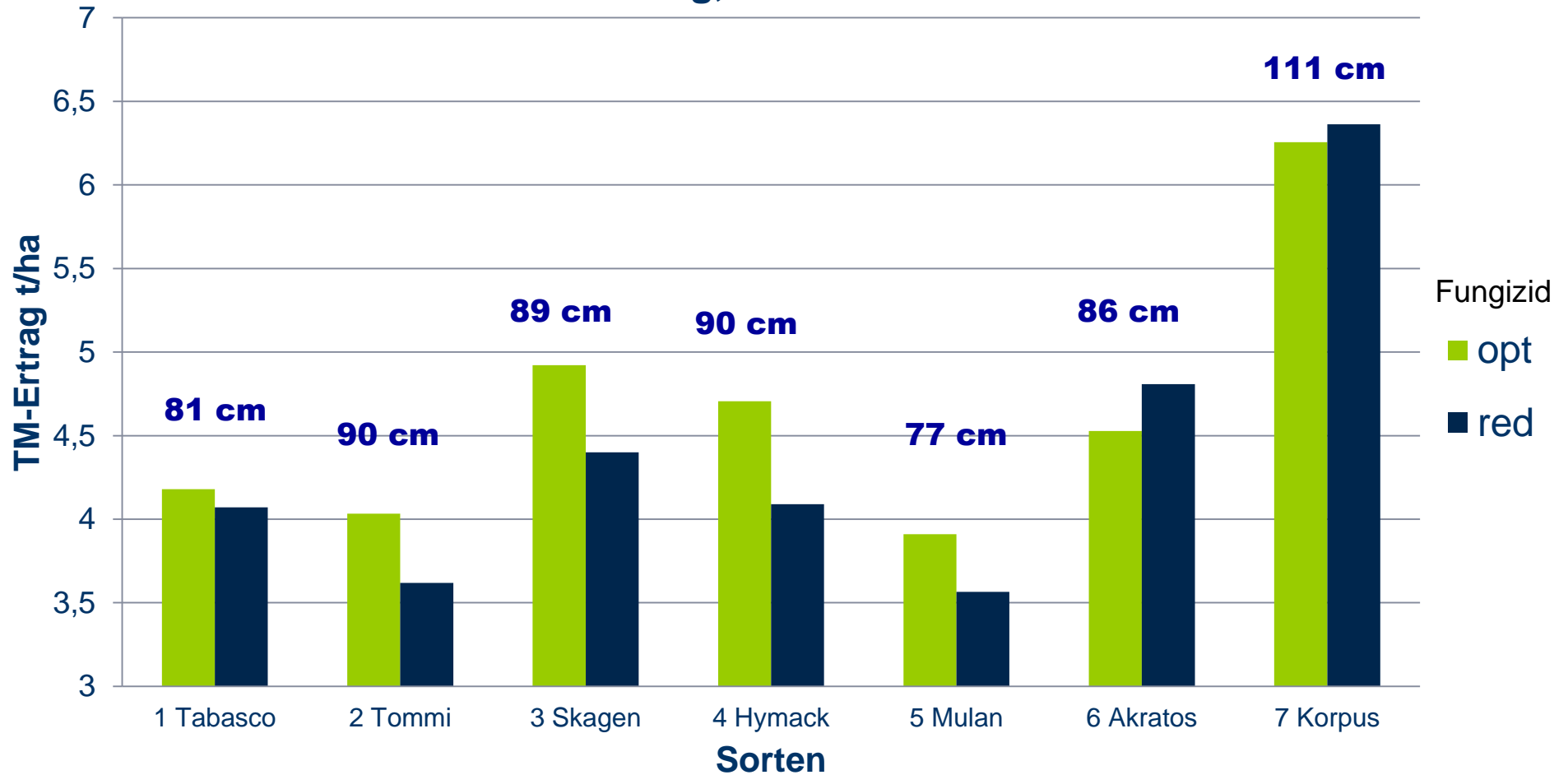


Straw yield

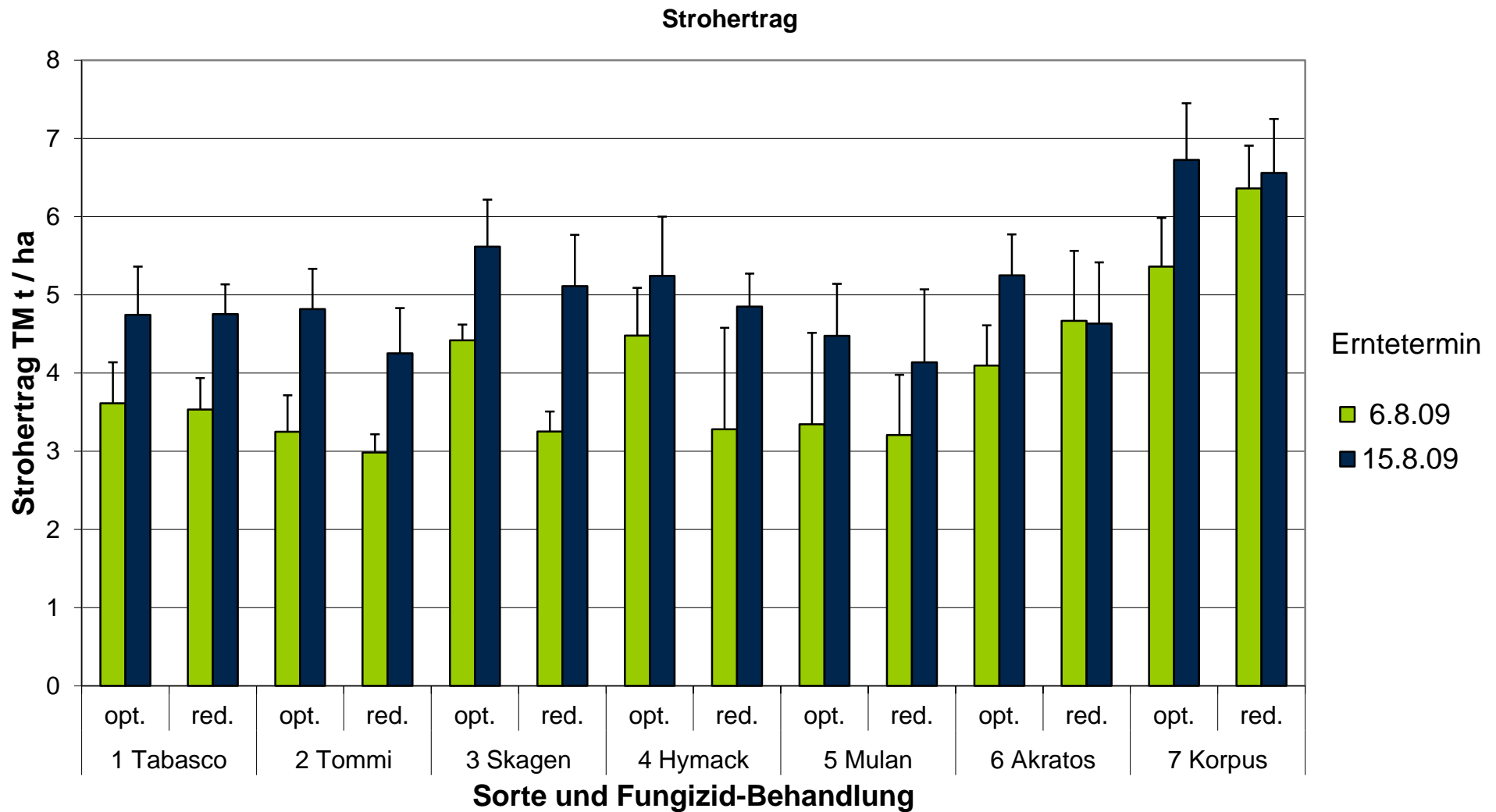


Straw yield (little impact of fungicide)

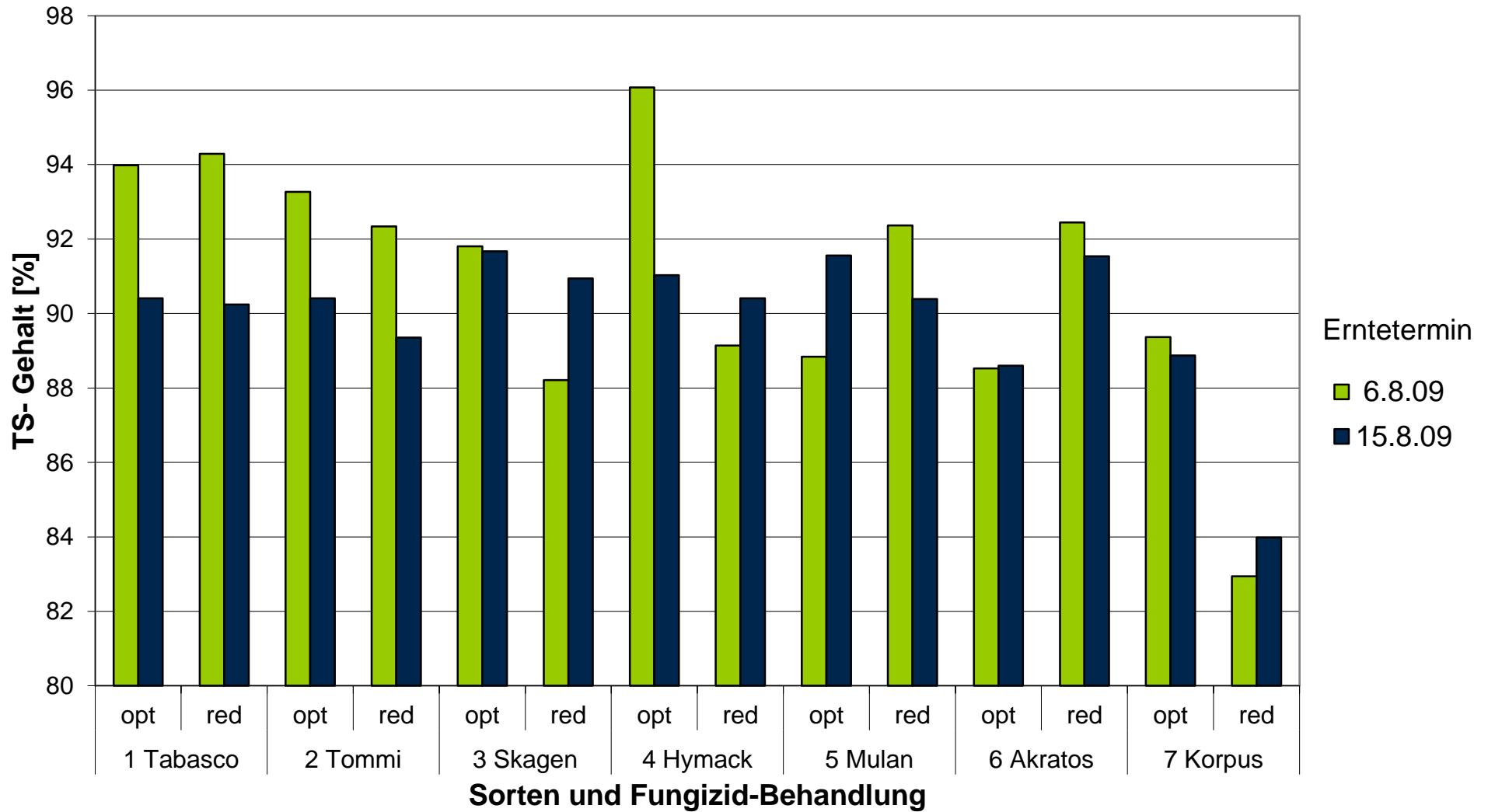
Strohertrag, Hovedissen 2009



Straw yields (impact of harvest date)



Dry matter %



Vacuuming Residues = short straw + chaff / husks

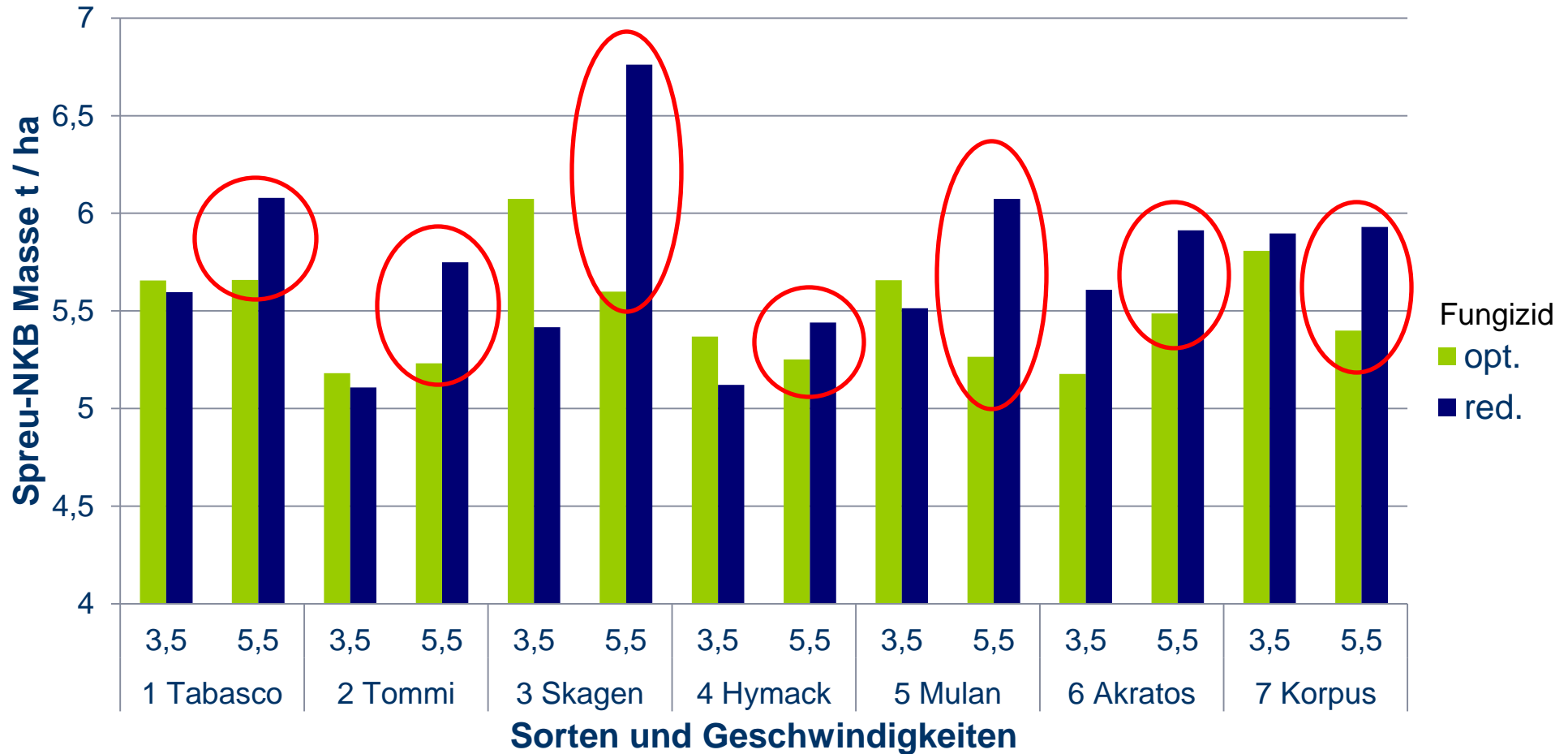


**2 samples at 3,5 und
5,5 km/h
all varieties and
treatments**

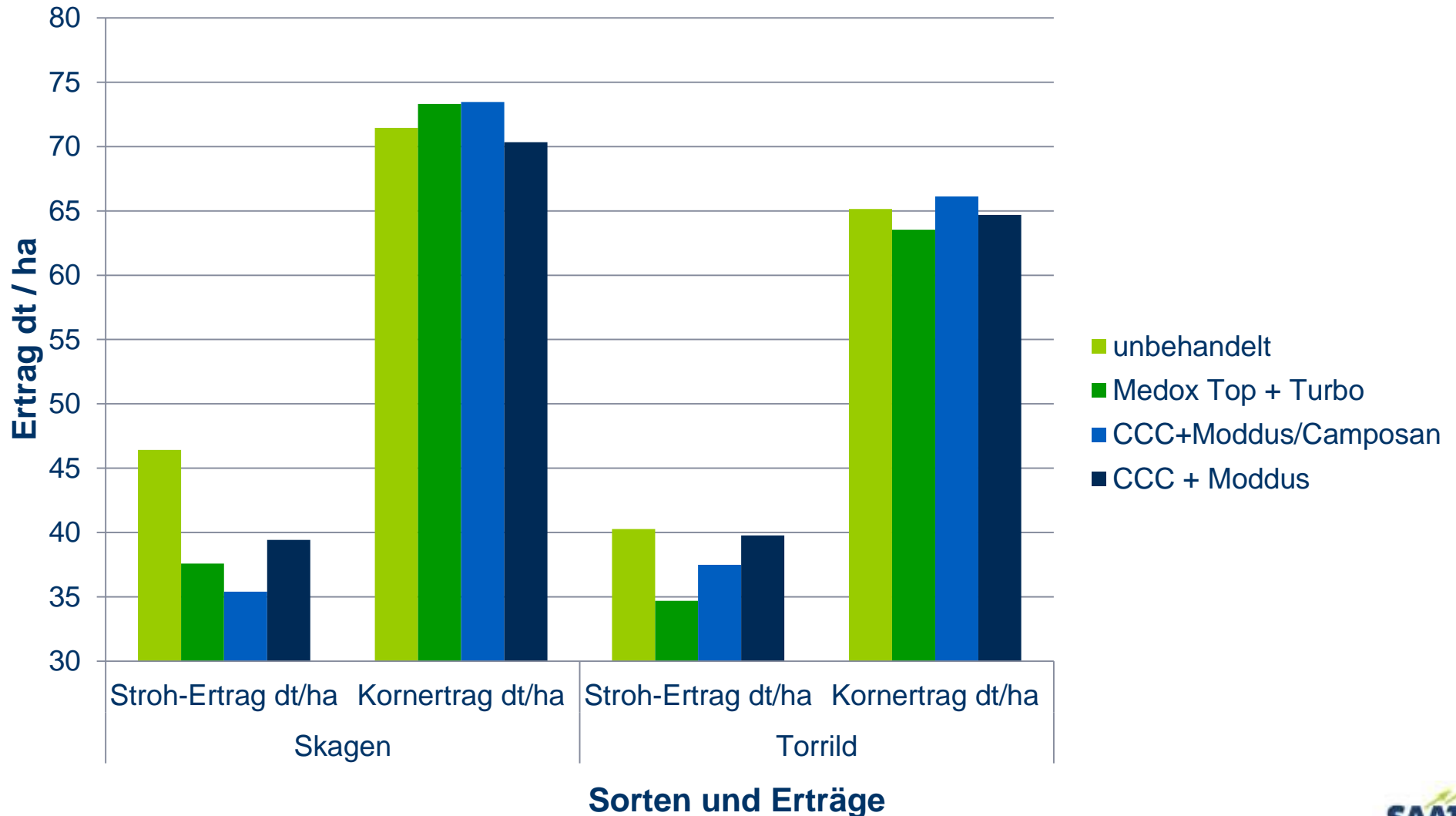


More residues with high velocity and reduced fungicide

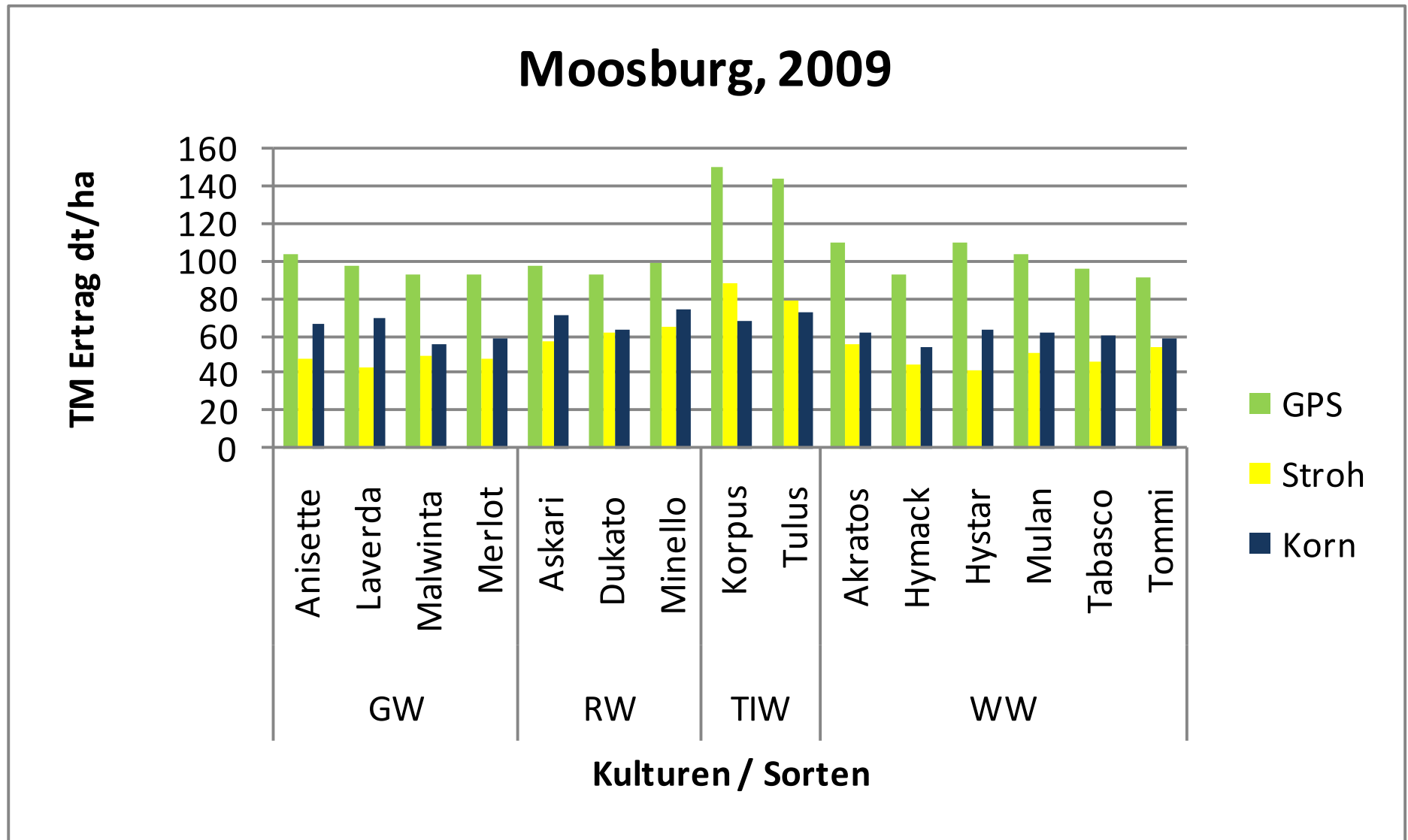
NKB- Anteile vs. Fungizid / versch. Geschw.



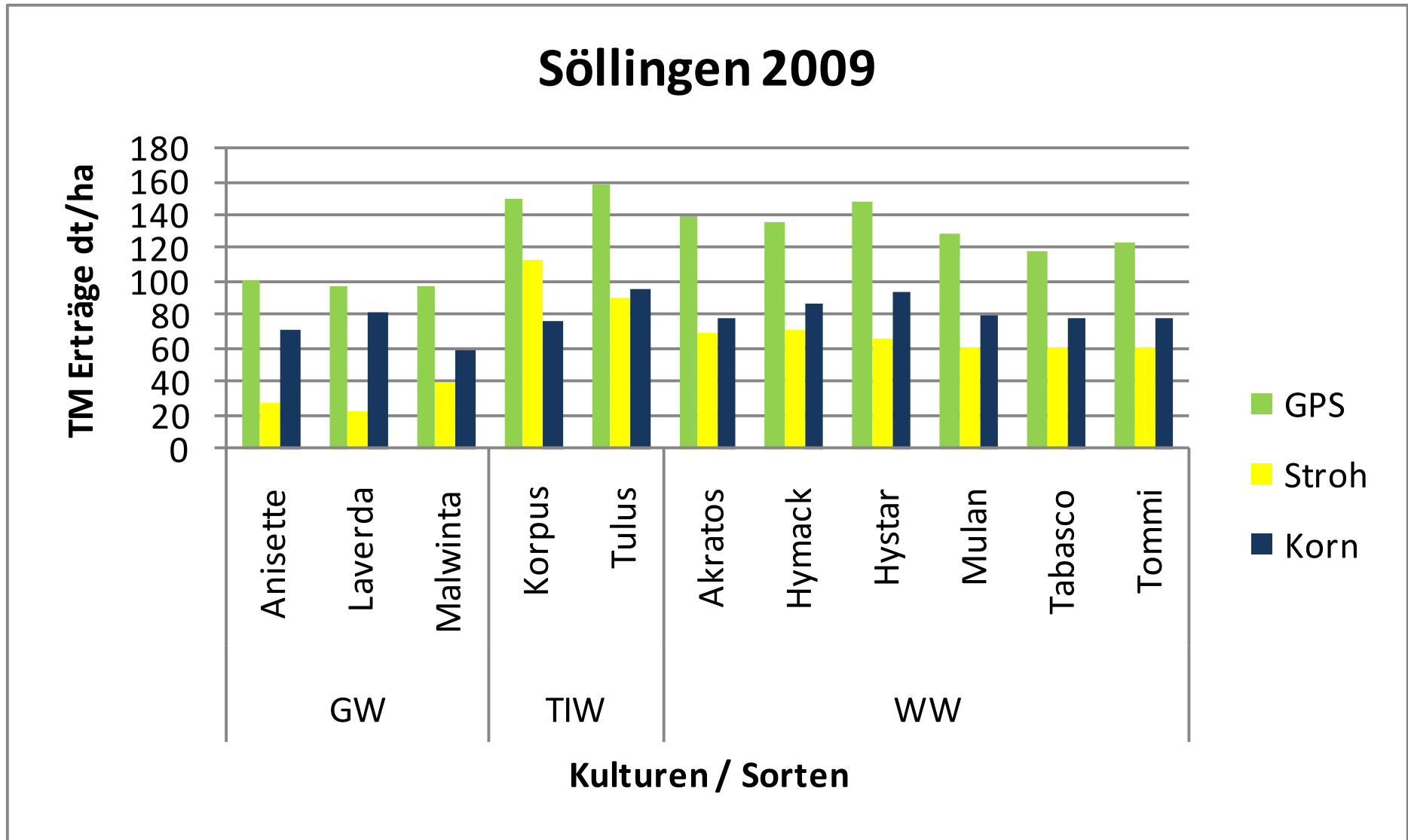
No uniform impact of growth regulators , small scale trials Moosburg 2009



Winter cereals: whole plant, straw and grain yields



Winter cereals: whole plant, straw and grain yields



Conclusions

- Strong impact of wheat variety and environmental conditions on straw yield
- Clear differences between the two harvest dates:
 - Higher moisture level caused less short straw and increased straw yield
- More residues (short straw and chaff) at higher velocities and reduced fungicide
- Growth regulators influence plant length but not necessarily straw yield
- Standard harvest technology does not result in standard amount of residue
- Amount and composition of residues need to be reevaluated to reach a better understanding how threatened the humus balance really is.

Thanks for your attention!

