

The effect of
ensiling on
variety rank of
maize silage

Jolien
Swanckaert

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Minisilos

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Effect of
variety,
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Starch

NDF

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Organic matter
digestibility

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Belgian forage maize trials

- Compare agronomic performances of new varieties with reference varieties
- Quality measurements are reported for unensiled varieties
→ Variety rank based on unensiled material

Quality differences between ensiled and unensiled (=fresh) material have been reported.

Is the relative variety rank altered?

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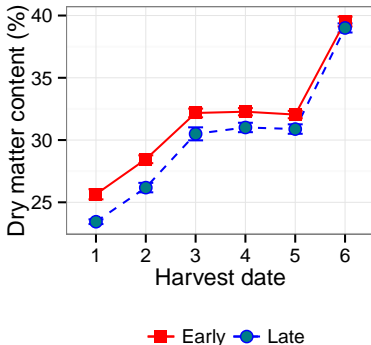
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- 8 varieties
- 6 harvest dates



Early	Late
Banguy	LG30.222
Kalientes	LG3220
LG30.224	Mas 17E
Ronaldinio	NK Falkone

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After 20 weeks



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Volatile components disappear during drying process

- Volatile fatty acids (lactic acid, acetic acid, propionic acid, butyric acid), ammoniac, ethanol
- Specific volatilization factor → correction factor (CF)
- Dulphy, J.P., Demarquilly, C., 1981. Correction de la teneur en matière sèche des ensilages. In: Prévion de la valeur nutritive des aliments des ruminants. INRA Publications, Versailles.

Example: $CF = 1.037$

$DM = 30 * 1.037 = 31.1\%$

$NDF = 50 / 1.037 = 48.2 \%$

$IVTD = (70 + 3.7) / 1.037 = 71.1\%$

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	DM	CP	Starch	NDF	OMD	DNDF
Ensiling	***	**	***	***	***	***
Variety	***	***	***	***	***	***
HD	***	***	***	***	***	***
Ensiling*Variety		**	**	***	***	***
Ensiling*HD	***	***	***	***		***
Variety*HD	***		***			**
Ensiling*Variety*HD						

*** p<0.001, ** p<0.01, * p<0.05

HD Harvest date
DM Dry matter content
CP Crude protein
OMD Organic matter digestibility
DNDF Cell wall digestibility

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	DM	CP	Starch	NDF	OMD	DNDF
Ensiling	***	**	***	***	***	***
Variety	***	***	***	***	***	***
HD	***	***	***	***	***	***
Ensiling*Variety		**	**	***	***	***
Ensiling*HD	***	***	***	***		***
Variety*HD	***		***			**
Ensiling*Variety*HD						

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HD Harvest date
DM Dry matter content
CP Crude protein
OMD Organic matter digestibility
DNDF Cell wall digestibility

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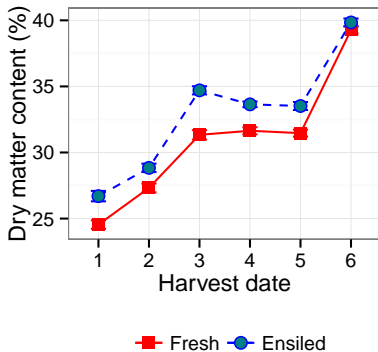
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	DM
Ensiling	***
Variety	***
HD	***
Ensiling*Variety	***
Ensiling*HD	***
Variety*HD	***
Ensiling*Variety*HD	***

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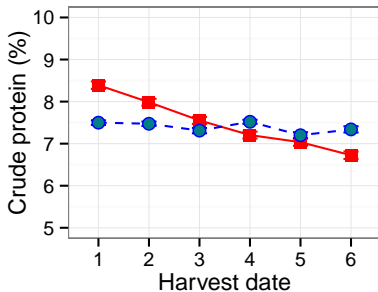
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■ Fresh ● Ensiled

	CP
Ensiling	**
Variety	***
HD	***
Ensiling*Variety	**
Ensiling*HD	***
Variety*HD	
Ensiling*Variety*HD	

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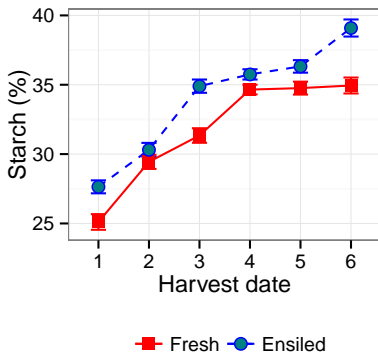
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	STARCH
Ensiling	***
Variety	***
HD	***
Ensiling*Variety	**
Ensiling*HD	***
Variety*HD	***
Ensiling*Variety*HD	

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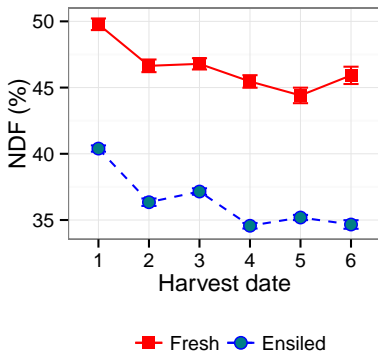
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	NDF
Ensiling	***
Variety	***
HD	***
Ensiling*Variety	***
Ensiling*HD	***
Variety*HD	
Ensiling*Variety*HD	

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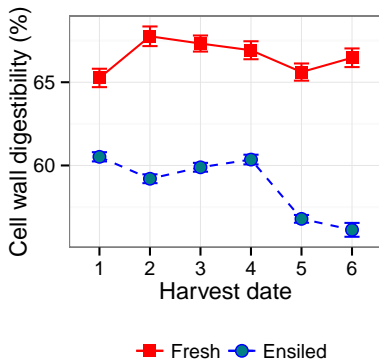
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	DNDF
Ensiling	***
Variety	***
HD	***
Ensiling*Variety	***
Ensiling*HD	***
Variety*HD	**
Ensiling*Variety*HD	

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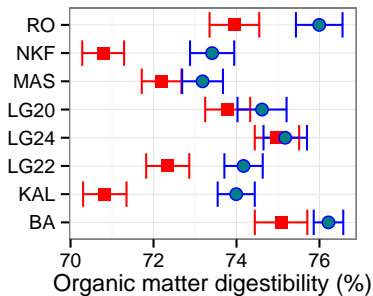
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■ Fresh ● Ensiled

	OMD
Ensiling	***
Variety	***
HD	***
Ensiling*Variety	***
Ensiling*HD	
Variety*HD	
Ensiling*Variety*HD	

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Effects on variety rank

Variety*Ensiling interaction → Variety rank changes

Table 1 : Harvest dates with a stable variety rank

	Harvest date					
	1	2	3	4	5	6
Crude protein	■	■			■	■
Starch	■	■	■	■		■
OMD	■	■		■		■
NDF	■	■				
DNDF	■					
All parameters	■					

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Thank you

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