

## **Supplemental Information**

# **Comparative Evaluation of Industrial Hemp Cultivars: Agronomical Practices, Feedstock Characterization and Potential for Biofuels and Bioproducts**

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† In memory of Dr. David W. Williams, a scholar, educator and good friend.

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**Table S1.** Cultivars evaluated in this study and their type and sources\*.

Cultivar Name	Type	Owner/source
Santhica 27	Dual-purpose	Terres Inovia, Thiverval-Grignon, France (standard entry)
Felina 32	Dual-purpose	Terres Inovia, Thiverval-Grignon, France (standard entry)
Bialobrzeskie	Dual-purpose	Institute of Natural Fibers, Poznan, Poland, (standard entry)
NWG 331	Dual-purpose	New West Genetics, Fort Collins, CO
NWG 452	Dual-purpose	New West Genetics, Fort Collins, CO
Futura 75	Fiber-only	Terres Inovia, Thiverval-Grignon, France (standard entry)
ASSO	Fiber-only	Schiavi Seeds
Carmaleonte	Fiber-only	Schiavi Seeds
Codimone	Fiber-only	Schiavi Seeds
Elleta Campana	Fiber-only	Schiavi Seeds
Fibranova	Fiber-only	Schiavi Seeds

\* Details on the cultivation conditions can be found at:

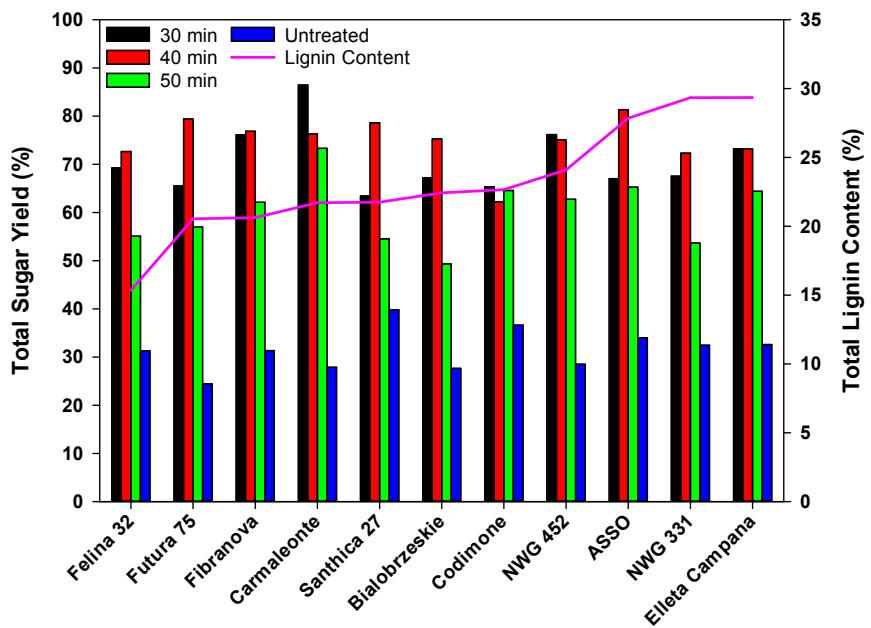
[https://hemp.ca.uky.edu/sites/hemp.ca.uky.edu/files/2017\\_fiber\\_only\\_report.pdf](https://hemp.ca.uky.edu/sites/hemp.ca.uky.edu/files/2017_fiber_only_report.pdf) and

[https://hemp.ca.uky.edu/sites/hemp.ca.uky.edu/files/2017\\_dual\\_purpose\\_report.pdf](https://hemp.ca.uky.edu/sites/hemp.ca.uky.edu/files/2017_dual_purpose_report.pdf).

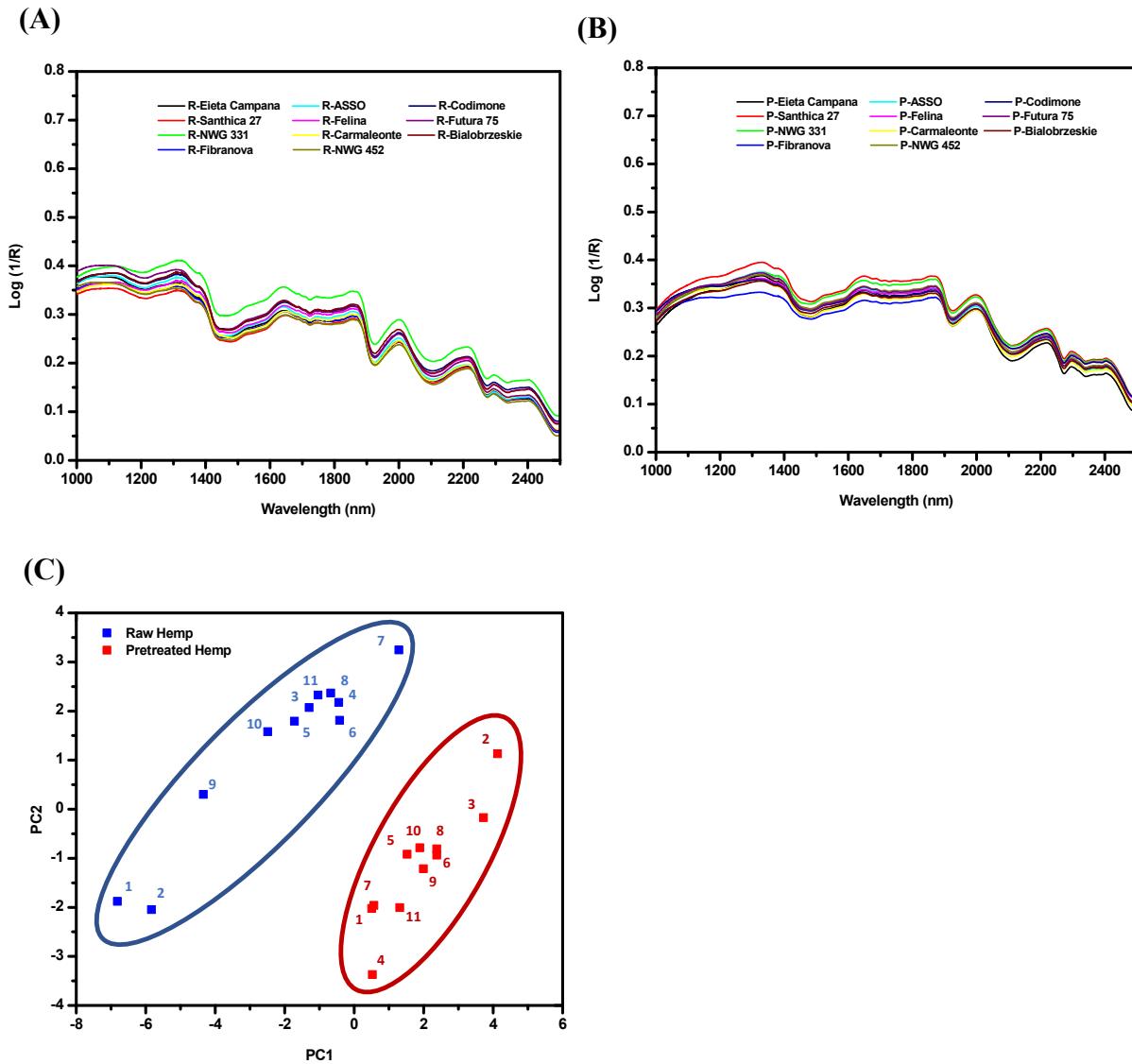
**Table S2** Summary of sugar recovery based on raw biomass form different liquid streams during pretreatment and enzymatic hydrolysis\*.

Type of Biomass	Sugars in Raw Biomass (g)	Dilute acid pretreatment								
		30 minutes			40 minutes			50 minutes		
		Sugars from enzymatic hydrolysis (g)	Sugars from pretreatment liquid (g)	Recovery (%)	Sugars from enzymatic hydrolysis (g)	Sugars from pretreatment liquid (g)	Recovery (%)	Sugars from enzymatic hydrolysis (g)	Sugars from pretreatment liquid (g)	Recovery (%)
Eletta Campana	50.1 (11.6)	32.3 (1.7)	2.2 (5.5)	68.8 (62.1)	34.9 (0.7)	4.5 (4.7)	78.7 (46.1)	27.4 (2.4)	2.1 (4.8)	58.9 (62.4)
Santhica 27	48.6 (11.3)	28.4 (1.3)	1.7 (3.0)	62.0 (38.0)	37.5 (0.7)	5.7 (4.5)	89.0 (46.2)	24.4 (1.2)	2.9 (3.5)	56.2 (41.4)
NWG 331	46.4 (12.5)	30.4 (1.3)	2.6 (6.5)	71.3 (62.7)	34.0 (0.8)	3.9 (4.6)	81.8 (43.3)	23.8 (1.2)	2.5 (4.6)	56.6 (46.4)
Fibranova	51.1 (11.0)	33.4 (1.9)	2.0 (4.7)	69.3 (60.0)	36.7 (0.7)	5.3 (6.6)	82.1 (66.4)	27.9 (1.2)	4.0 (5.0)	62.5 (56.8)
ASSO	46.7 (12.3)	29.8 (1.5)	2.4 (5.1)	69.1 (53.7)	39.0 (0.7)	5.3 (6.3)	94.8 (57.0)	29.0 (1.5)	3.8 (5.6)	70.3 (57.6)
Felina 32	43.8 (12.4)	30.7 (1.6)	3.2 (6.0)	77.6 (60.9)	34.4 (0.8)	5.5 (5.1)	91.1 (47.5)	25.1 (1.0)	3.2 (3.6)	64.5 (36.7)
Carmaleonte	47.5 (11.6)	36.2 (2.8)	1.0 (3.5)	78.3 (54.8)	35.7 (1.0)	3.8 (5.4)	83.1 (54.8)	30.7 (2.5)	1.9 (5.3)	68.5 (67.3)
NWG 452	45.4 (12.0)	35.1 (1.2)	2.5 (6.4)	82.7 (63.6)	35.9 (0.7)	4.3 (4.3)	88.5 (41.5)	28.8 (1.0)	2.4 (3.1)	68.8 (34.0)
Codimone	45.9 (11.0)	28.5 (1.7)	1.3 (2.8)	64.8 (40.8)	29.5 (0.7)	5.6 (6.5)	76.5 (65.1)	28.2 (1.6)	2.8 (4.1)	67.6 (51.9)
Futura 75	50.1 (12.2)	29.7 (1.2)	2.3 (4.4)	63.9 (46.0)	37.9 (0.7)	5.5 (5.8)	86.7 (53.5)	25.4 (1.2)	4.0 (5.6)	58.6 (55.7)
Bialobrzeskie	48.6 (13.1)	30.6 (1.2)	1.5 (3.9)	66.2 (38.9)	35.9 (0.7)	4.6 (5.0)	83.3 (43.2)	21.8 (1.1)	2.7 (3.8)	50.4 (37.6)

\*Sugar values reported are all based on the glucan and xylan (in parenthesis) content in raw biomass.



**Figure S1.** Correlations between sugar yields and lignin content of hemp cultivars.



**Figure S2.** NIR characterization of **A)** raw and **B)** pretreated hemp samples and **C)** principle component analysis of raw (in blue) and pretreated (in red) samples of 1. Eleta Campana, 2. Santhica 27, 3. NWG 331, 4. Fibranova, 5. ASSO, 6. Felina 32, 7. Carmaleonte, 8. NWG 452, 9. Codimone, 10. Futura 75, 11. Bialobrzeskie.