

Corn Stover

REFERENCE MATERIAL

Pedigree

Location: Boone County, IA
Harvested: 2011
Received at INL: 2012

Harvest Method: Single pass
Sample Preparation: Ground to pass through a 1-inch sieve using a Vermeer BG480 grinder and a Bliss Hammermill with no screen

Composition

Table 1. Chemical composition^a of Reference Corn Stover (mean of analyses completed 11/2014 & 4/2015)

%Structural Ash	%Extractable Inorganics	%Structural Protein	%Extractable Protein	%Water Extracted Glucan ^b
2.37	1.48	1.84	0.72	0.62
%Water Extracted Xylan ^b	%Water Extractives Others	%EtOH Extractives	%Lignin	%Glucan
0.47	4.46	2.73	16.37	35.45
%Xylan	%Galactan	%Arabinan ^c	%Acetate	%Total
22.34	1.54	3.40	1.58	95.37

^aDetermined using NREL "Summative Mass Closure" LAP (NREL/TP-510-48087)

^bDetermined by HPLC following an acid hydrolysis of the water extractives

^c%Arabinan value includes %mannan, because arabinose and mannose co-elute on the HPLC column

Proximate, Ultimate & Calorimetry

Table 2. Proximate, ultimate, and calorific values for Reference Corn Stover (reported on a dry basis; completed 6/2014)

Proximate ^a			Ultimate ^b			Calorimetry ^c	
%Volatile	%Ash	%Fixed Carbon	%Hydrogen	%Carbon	%Nitrogen	HHV	LHV
79.0	4.3	16.7	5.7	48.7	0.7	7990	6614

^aProximate analysis was done according to ASTM D 5142-09

^bUltimate analysis was conducted using a modified ASTM D5373-10 method (Flour and Plant Tissue Method) that uses a slightly different burn profile

^cHeating values (HHV, LHV) were determined with a calorimeter using ASTM D5865-10

Elemental Ash

Table 3. Elemental ash composition^a of Reference Corn Stover (completed 6/2014)

%Al as Al ₂ O ₃	%Ca as CaO	%Fe as Fe ₂ O ₃	%K as K ₂ O	%Mg as MgO	%Mn as MnO	%Na as Na ₂ O	%P as P ₂ O ₅	%Si as SiO ₂	%Ti as TiO ₂	%S as SO ₃
0.28	8.99	1.12	26.38	6.09	0.09	0.08	2.79	51.99	0.01	2.20

^aDetermined as described in ASTM standards D3174, D3682 and D6349

Particle Characteristics

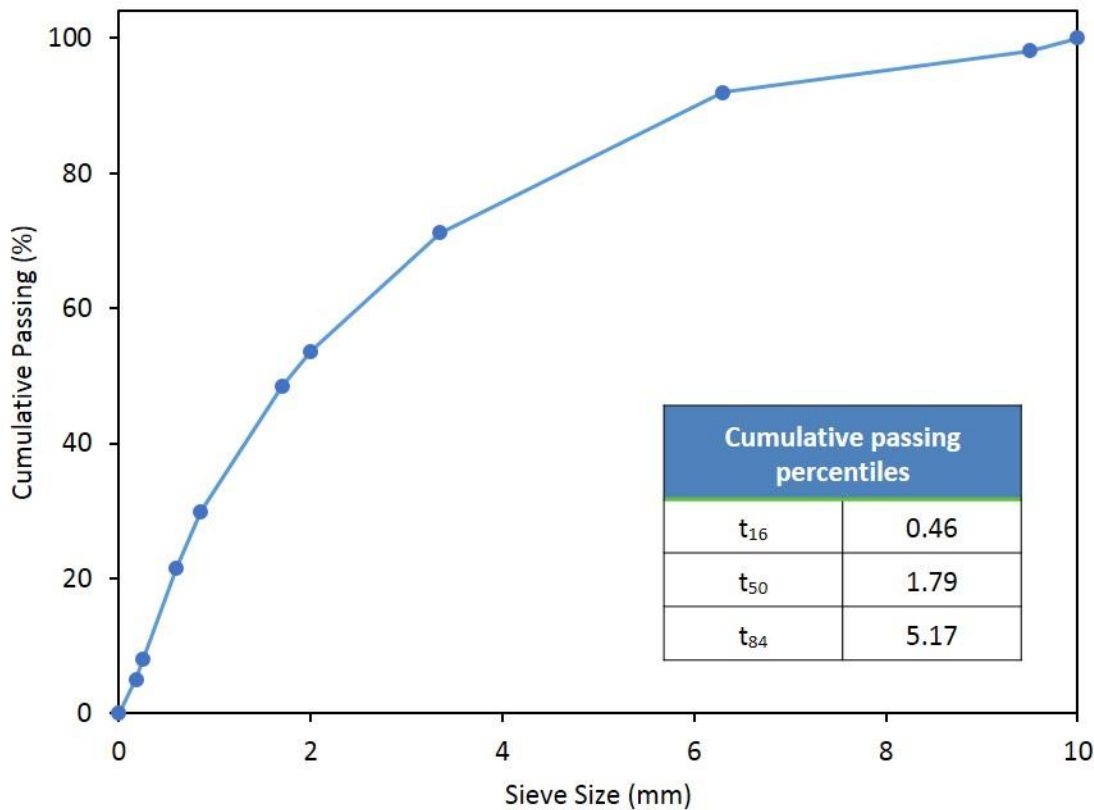


Figure 1. Cumulative passing percent of 1-inch Reference Corn Stover determined according to ANSI/ASAE S319.4 using a Ro-Tap test sieve shaker (Model RX-29, W.S. Tyler) and a 15 minute total sieving time (completed 4/2015). The cumulative passing percentile sieve sizes (e.g., t₁₆) were calculated by interpolation and represent theoretical sieve sizes that would retain 16, 50 or 84% of the particles by mass.

Contact

For questions regarding biomass material or analytical data please contact Amber Hoover at amber.hoover@inl.gov or 208-526-5992.

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