#### **Moisture Content Change**

Enda Coates W.I.T.

# Defining moisture content

- Key variable in energy content of wood fuel.
- Lower moisture content = higher calorific value.
- Also determines suitability of storage without decomposition.
- CENT/S 14961

## Moisture content specifications

% weight as received

Moisture Content Class	Maximum Moisture Content	Comment
M20	≤20%	Dried
M30	≤30%	Suitable for storage
M40	≤40%	Limited suitability for storage
M55	≤55%	_
M65	≤65%	-

#### **Moisture Content Determination**

For biofuels, moisture content is calculated on a wet basis.

Wet basis: moisture content is expressed as a percentage of total weight.

Moisture content (%) = [(wet weight – dry weight)/wet weight] \* 100

# Sample size

- 4 sites
- 3 assortments per site
- At Spring harvest:
  - 5 samples per assortment
  - 5 replicates per sample
- At Autumn chipping: sample size dependant on machine.
  - Slivatec machine: 2 samples per load, 3 replicates per sample
  - Musmax: 8 samples per truck, 3 replicates per sample
  - TP: 3 samples per load, 3 replicates per sample.

#### Procedure

- Approx 1000g bags collected and weighed immediately onsite (wet weight).
- Dried in oven at 105°C for minimum of 48 hours
- Reweighed immediately after extraction from oven (dry weight).

# MC Spring 2007

Site	Species	Assortment	MC %	MC Class
Abbeyfeale	SS	EW	60.40	65
Abbeyfeale	SS	RW	61.30	65
Abbeyfeale	SS	WT	56.30	65
Ballybofey	SS	EW	61.70	65
Ballybofey	SS	RW	64.68	65
Ballybofey	SS	WT	61.21	65
Bweeng	SS	EW	55.41	65
Bweeng	SS	RW	59.04	65
Bweeng	SS	WT	52.37	55
Woodberry	SS	EW	58.50	65
Woodberry	SS	RW	60.00	65
Woodberry	SS	WT	54.60	55

# SS MC Spring 2007



#### Variation between assortments Spring 2007



#### MC Autumn 2007

Site	Species	Assortment	Covered/ Uncoverd	MC	MC Class
Abbyfeale	SS	EW	С	53.60	55
Abbyfeale	SS	RW	С	47.70	55
Abbyfeale	SS	WT		52.70	55
Ballybofey	SS/L	EW	С	57.57	65
Ballybofey	SS/L	RW	С	56.11	65
Ballybofey	SS/L	WT		47.93	55
Bweeng	SS	EW	С	52.47	55
Bweeng	SS	RW	С	46.70	55
Bweeng	SS	WT		43.75	55
Woodberry	SS	EW	UC	60.10	65
Woodberry	SS	EW	С	45.45	55
Woodberry	SS	RW	С	41.90	55
Woodberry	SS	RW	UC	54.15	55
Woodberry	SS	WT		45.93	55

#### MC SS Woodberry 2007: Covered and Uncovered Assortments



## MC SS Autumn 07



EW and RW assortments covered

#### Variation and Comparison of Assortments



Assortment	MC%	MC Class	Assortment	MC%	MC Class
WT	56.12	65	WT	47.46	55
EW	59.00	65	EW	50.51	55
RW	61.26	65	RW	45.43	55

Autumn RW and EW Assortments Covered

# MC Change over Season



RW and EW Assortments Covered

# Ballybofey SS/L mix comparison



#### EW and RW Assortments Covered

## Conclusions

- Whole tree assortment had lowest initial MC.
- Covered round wood assortment seasoned most.
- Covering stacks increases moisture loss.
  - Up to 14.65% further reduction in round wood assortment at Woodberry site.
- Uncovered energy wood assortment gained moisture