

EPA Certification Tests: from cribwood to cordwood

Adam Baumgart-Getz - EPA

March 7th, 2018

Overview

- Quick introduction to EPA's wood heater rule
- Why is a cordwood test important
- EPA's current goals- Provide the foundational work for transition to cordwood
- This work is ongoing - Stay tuned!

Cordwood & Cribwood



Cordwood

Cribwood

Project Context - Wood stoves

- EPA's 2015 Wood Heater rule covers residential wood heating devices
 - Updated 1988 wood heater rule
 - Residential Wood Heater (RWH) New Source Performance Standard (NSPS)
 - Regulates all residential wood heaters manufactured after May 2015
- Today's Discussion is limited to wood stoves:
 - Step 1 - May 2015 (wood stoves = 4.5 g/hr)
 - Step 2 - May 2020 (wood stoves with crib = 2.0 g/hr)
 - Step 2 of wood heater rule includes option to test with cordwood for Step 2 (2.5 g/hr)
 - For wood stoves, there is no federally referenced test cordwood method - case by case basis

Project Context - Wood Stoves

- Current cribwood method (Method 28)
 - Based on douglas fir cribwood
 - Operational protocol:
 - Batch load
 - 4 burn rates/hot to hot steady state
 - PM Measurement -
 - Dilution tunnel
 - Filter-based measurements

Why transition to cordwood?

- States are interested in addressing residential wood heating emissions
 - Want a better understanding of wood smoke impacts on air sheds
 - Especially concerned about subsidies for local changeouts
- Industry has also raised issues with current test methods
 - Design stoves to pass certification tests
 - Current test methods do not reflect home use

Goals of EPA Test Method Development

- Develop test methods that:
 - Reflects what might be expected from in-home use
 - Captures typical emission cycles
 - Potential to validate field performance
- Create technical foundation to inform development of the test methods
 - What is impact of species?
 - What is impact of cordwood vs. cribwood?



- Vermont Castings Vigilant (Pre 1988 RWH NSPS)
- A Pre-NSPS stove was selected in order to characterize emissions with minimal influence of control technology.

Basic Research Approach

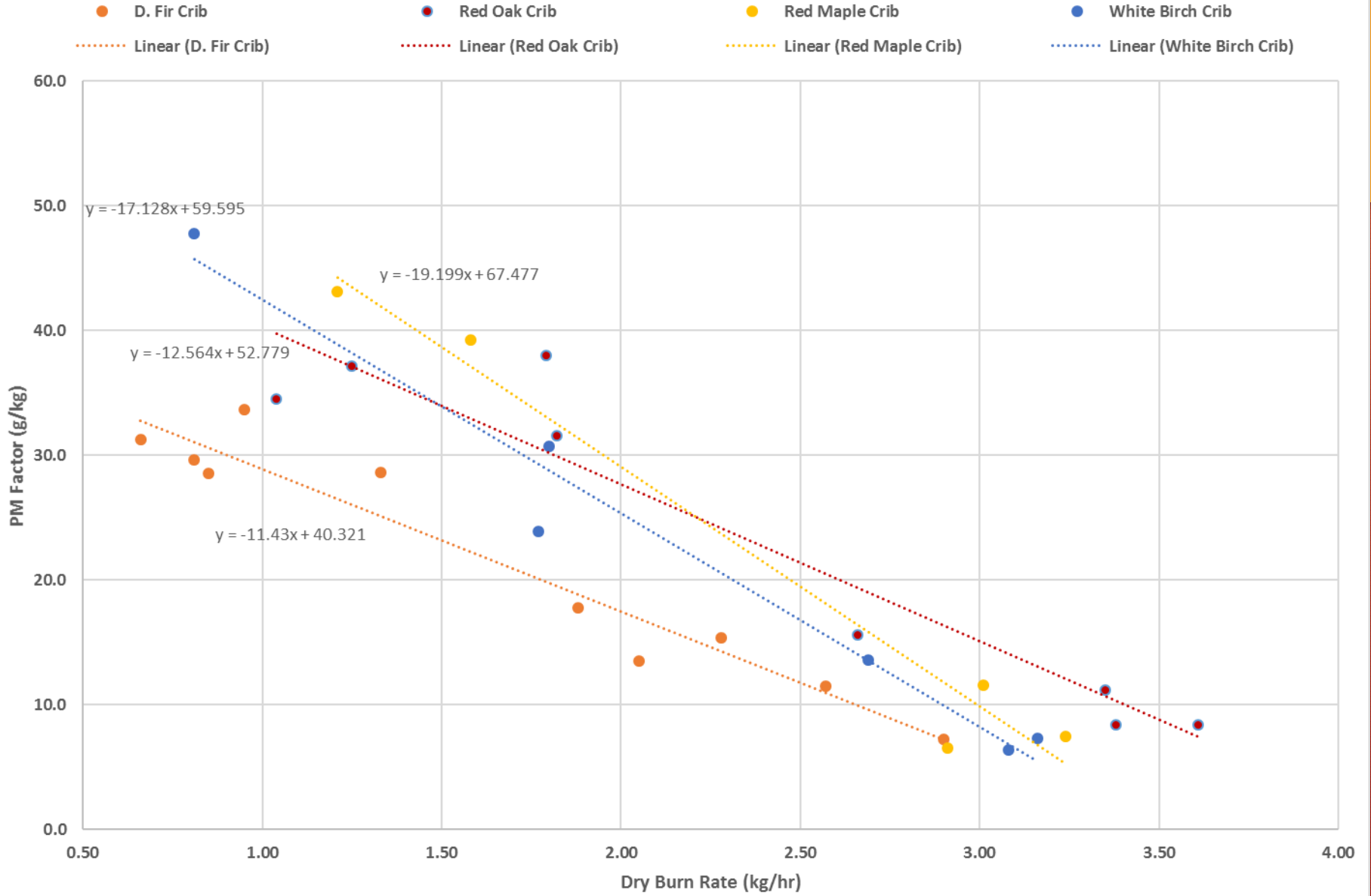
- Five wood species were identified based on availability to test laboratories and manufacturers:
 - White Pine
 - Red Oak
 - Red Maple (Soft Maple)
 - White Birch
 - White Ash
- A comparison of Douglas fir crib loads to crib loads of these species was the first step.
 1. Compare impact of species on cribwood
 2. Compare difference between cribwood and cordwood for each species



Test protocol Outline

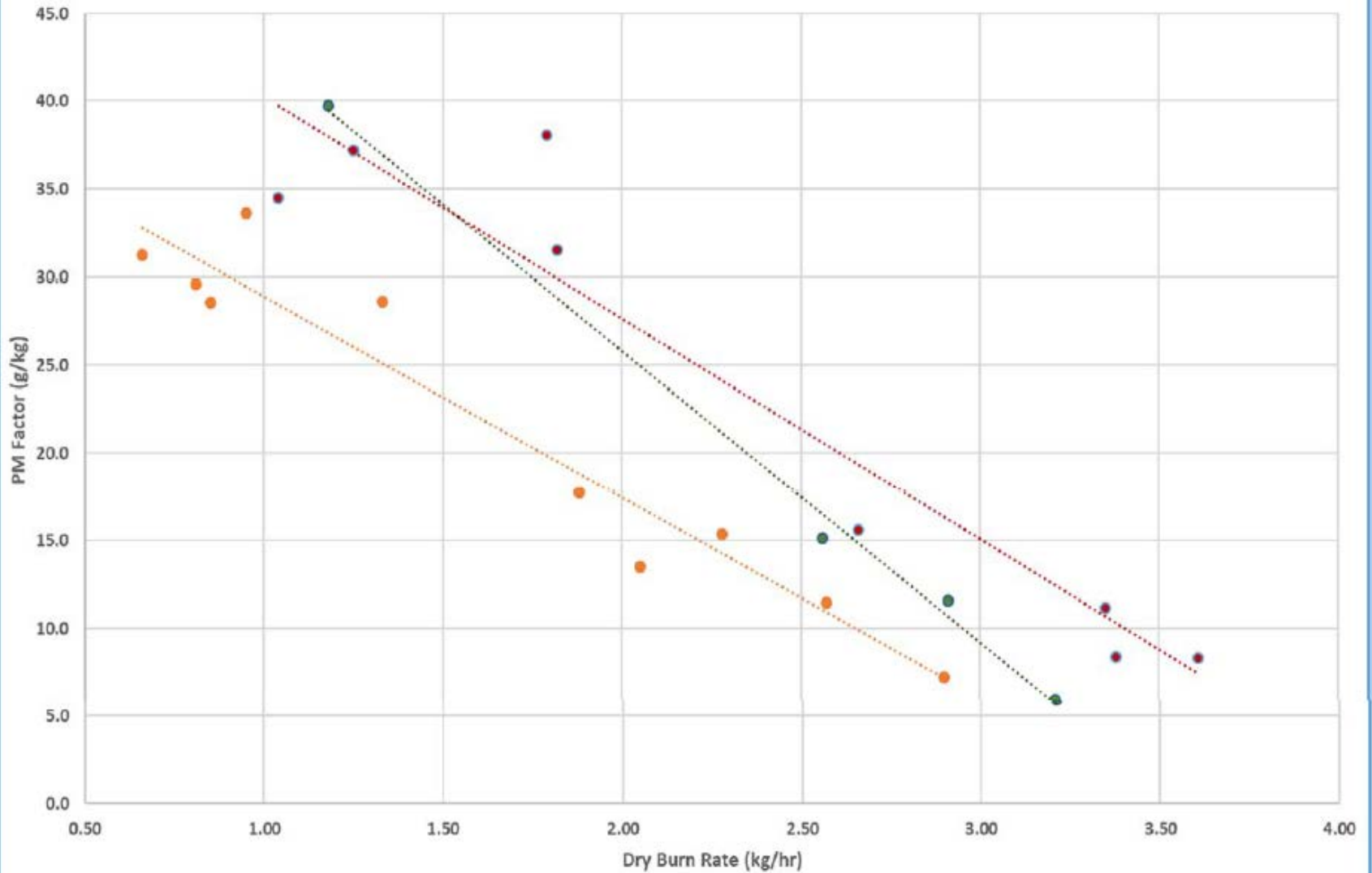
- Initial experimental matrix included:
 - 3 High Fire tests (wide open)
 - 2 tests at a lower air setting
 - Additional test runs were performed to “fill-in” perceived gaps in the data.
- Cordwood matrix of tests includes:
 - 2 high fire tests
 - 1 low fire test

PM Factor vs. Burn Rate



Cordwood - PM Factor vs. Burn Rate - Red Oak

● D. Fir Crib ● Red Oak Crib ● Red Oak Cord Linear (D. Fir Crib) Linear (Red Oak Crib) Linear (Red Oak Cord)



Further information and data:

[Docket ID: EPA-HQ-OAR-2016-0130, Process for
Developing Improved Cordwood Test Methods for
Wood Heaters](#)