Evaluation of Wildland Fire Chemicals

STANDARD TEST PROCEDURES

Retention on a Dowel Tree

Summary: A measure of an enhanced water mixture consistency and retention on fuels can be obtained by the use of a simple dowel tree which is immersed and then removed from a test product and weighed.

Equipment:

Balance, readable to 0.001 grams
Test sample in quart jar or similar tall container
Dowel with hanger and support device

Dowel Tree Construction:

Prepare a simple dowel tree to evaluate the retention of water enhancer mixtures.

- The trunk of the tree is a 0.5-inch dowel, six inches long.
- A 0.125-inch hole drilled 0.25 inch from the top of the trunk serves as a hanger.
- A thin, shallow line cut into the wood, two inches from the top of the trunk marks the immersion level.
- Four holes to accommodate 0.125-inch dowels were drilled in the trunk starting 0.5 inch from the bottom of the trunk, at 0.5-inch intervals. Each hole is offset by 45 degrees from the hole below.
- Dowels, 0.125-inch in diameter and 2.5-inches long were fitted snuggly into the holes and centered.

Test Method:

1. Suspend a tree by a wire hanger or Dacron loop from a ring stand or similar support. Place the apparatus and tree on a balance capable of weighing to at least 1.0 mg. Ensure that the tree is suspended beyond the balance.
2. Record the weight of the tree.
3. Place a watch glass or other container below the tree, not on the balance.

4. Using a lab jack or other support, place a quart jar of water enhancer mixture under the suspended tree.
5. Adjust the lab jack to hold the water enhancer at a height to expose the tree to the immersion mark.
6. Suspend the tree to the mark (bottom four inches on trunk) in a quart jar of water enhancer mixture for 60 seconds.
7. Remove the tree from the mixture and record the weight of the suspended tree and apparatus every 10 seconds for a total of 60 seconds.
8. Continue monitoring the weight at 60 second-intervals for 5 minutes.
9. Prepare a graph of weight loss versus time.

Possible Scoring and Requirement: Based on the amount of product remaining on the tree or the time to reach a selected percent of original quantity remaining, categorize each product as to retention.