

MSC Protocol for Determining Chromated Copper Arsenate Levels in Horticultural Mulches

Purpose is to determine if any materials containing the wood preservative, Chromated Copper Arsenate (CCA), have been used in the production of a specific mulch product.

Materials

A mulch sample will be sent to the Horticultural Substrates Laboratory, NC State University for testing. A sample will consist of at least two cubic feet of mulch. Preferably, the sample will be in a bag as it would be ready for sale (e.g., 2 cu ft or 3 cu ft bag).

A.If XRF technology is available at the testing facility, START HERE:

XRF Procedure

1. Each sample will be first tested using the X-Ray Fluorescent Spectrophotometer (XRF).
2. The sample will be analyzed non-destructively through the sample bag using a one-minute exposure per reading.
3. Five (5) readings will be taken on both the front and back of the sample for a total of 10 readings.
4. If after 10 readings no copper, chromium or arsenic are detected*, no further analysis will be required.
5. If any detection of copper, chromium or arsenic is found, the entire sample will be tested further as described below.

Open Bag Procedure

1. The contents of the sample will be emptied into a large plastic tray and further examined for CCA.
2. The entire sample will be visually examined.
3. Suspicious pieces will be tested with the XRF Analyzer.
4. Those pieces with detections of As, Cu or Cr will be returned to the bag for further testing as described below.
5. The entire bag sample will be tested as described below.

B. If XRF technology is not available at the testing facility, START HERE:

Pre-test Grinding Procedure

1. The sample mulch will be ground so as to pass through a 1/16th inch sieve screen.
2. The ground mulch will be thoroughly mixed and placed back into the original bag for samples.

Sample Procedure

1. Samples will be collected through a diagonal cross section using a modified version of the AOAC procedure for dry products.
2. Three samples will be collected for analysis.

Sample Preparation

1. Samples will be digested using a microwave-assisted acid digestion of siliceous and organically-based matrices (EPA Method 3052).
2. A five (5) gram sample will be used instead of the typical 0.5 gram sample for analysis.

Analysis

1. Once the sample is digested, it will be analyzed for arsenic, chromium and copper content using inductively coupled plasma-mass spectrometry (EPA Method 6020).

Pass/Fail

1. If the average values for the all three metals are below 10 ppm, the sample will have passed the MSC CCA Test for Landscape Mulches.
2. If the test values are 10 ppm or more, new samples of the mulch product will be requested and retested for verification. If the retest is similar to the original, the mulch will be considered to contain CCA and will fail the MSC CCA Test for Landscape Mulches.

*Lower Detection Limit for As = 4ppm, Cu = 22ppm & Cr = 84ppm.