



Alternative Preservatives for Residential Construction

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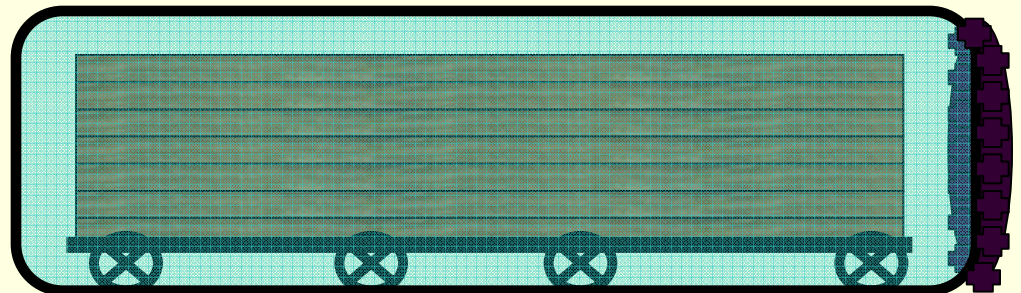
Presentation Topics

- Introduction
- Changes for CCA
- Potential CCA Alternatives
 - Characteristics and availability
 - Environmental perspective
 - On the horizon
- Specification and Quality Control
 - Specifying and End-tags
 - New Use Category Standards
- Summary



What is Treated Wood?

- Preservatives are forced into wood using a pressure process
 - Solid wood and some wood composites
- Or, Chemicals are incorporated into composite furnish (i.e. OSB)
- Or, Chemicals are applied by short dip or vacuum process (millwork)





Oil-type Preservatives

- Generally “heavy duty” industrial uses
 - Railroad ties
 - Utility poles
 - Piles
 - Heavy timbers and Glue-laminated members
- Examples
 - Creosote
 - Pentachlorophenol
 - Copper Naphthenate





Water-type Preservatives

- Also used in heavy duty industrial applications
- Greatest volume in residential applications
 - Decks
 - Fences
 - Permanent wood foundations
 - Sill plates
 - Playground equipment
- “Green-treated” wood sold at retail lumber yards



Residential CCA Uses Still Allowed

- Permanent Wood Foundations
- Engineered Wood (plywood, glue-lam, structural composite lumber)
- Support poles and posts (round) and timbers over 5 inches thick
- Shakes and shingles





RnD on CCA Alternatives

- On-going for decades
- CCA producers very active in evaluating new preservatives
- FPL and University Labs





But Developing a new Preservative is not easy

- Efficacy against decay fungi and insects
- Cost, cost, cost
- Permanence when weathered
- Practical for treating plant
- Able to penetrate wood
- Effect on wood properties (strength)
- Standardization for codes and credibility
- EPA registration



Near-term CCA Alternatives

- Commercially Available now:
 - Alkaline Copper Quat (ACQ types B, C, D)
 - Copper Azole (CBA-A and CA-B)
- Standardized but availability?
 - Copper Citrate (CC)
 - Copper Dimethyldithiocarbamate (CDDC)
- Standardized Above-Ground
 - Copper HDO or Copper Xyligen (CX-A)
 - Pending EPA registration



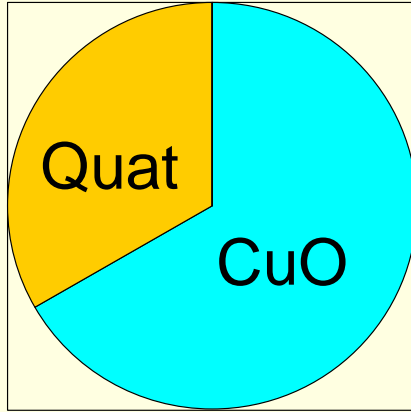
General Comparison to CCA

- All use copper as primary biocide
- None have arsenic or chromium
- All are alkaline systems... CCA is acidic
- Raw materials are more expensive
- They cannot be concentrated as greatly as CCA (higher shipping costs)
- All look similar to CCA treated wood

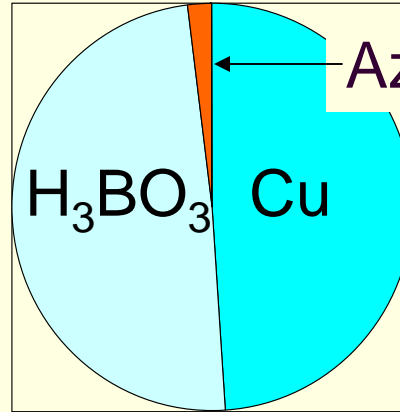


Comparison of Active Ingredients

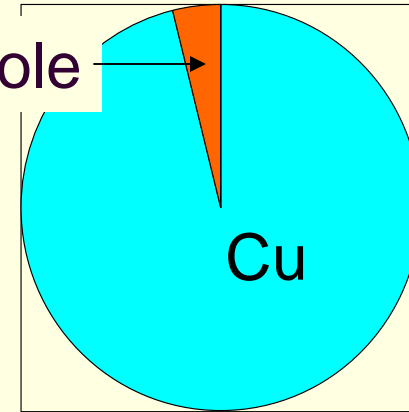
ACQ-B,C,D



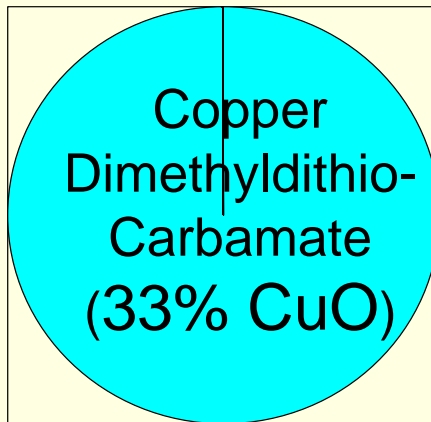
CBA-A



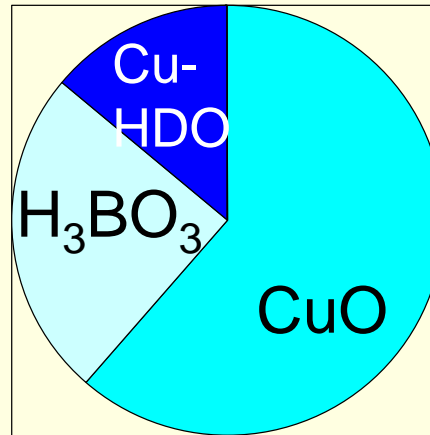
CA-B



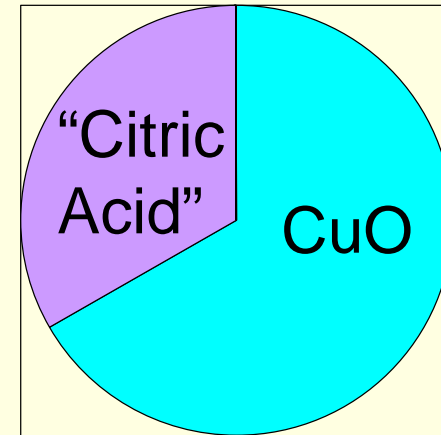
CDDC



CX-A



CC





A Closer Look at ACQ

- Longest time on market of alternatives
- Sold under various trade names
 - ACQ Preserve
 - Naturewood
 - AC2
- Several Formulas
 - ACQ-B (ammonia)
 - ACQ-D (amine)
 - ACQ-C (new quat)
- Available in many areas





A Closer Look at Copper Azole

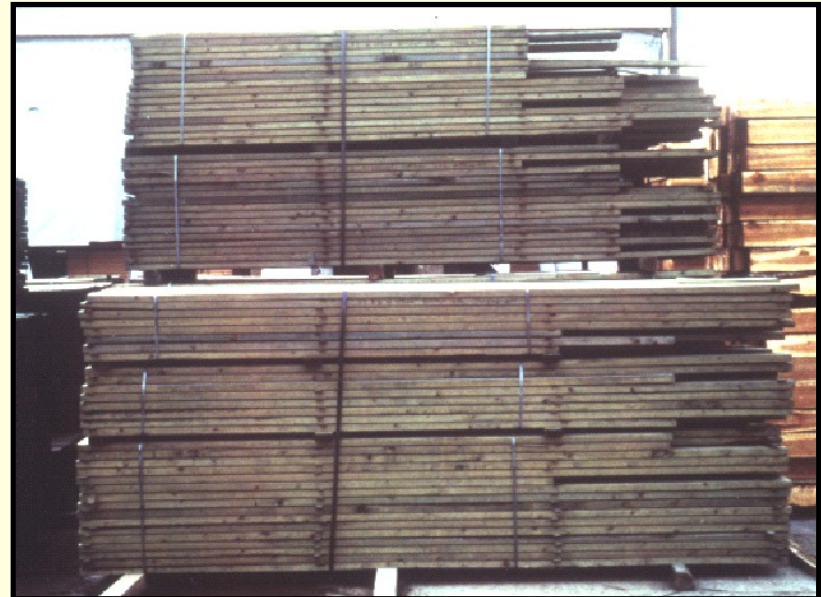
- Trade Name: Natural Select
- Two Formulas
 - CBA-A
 - CA-B
 - Typically amine solvent
- Available in many areas





A Closer Look at Copper Citrate

- Ammoniacal formulation
 - May improve treatment of some species
- Currently niche market
- Limited availability





A Closer Look at CDDC

- Reaction product requires a two-stage treatment process
 - Separate Cylinders
- Trade Name Kodiak
- Not currently available





A Closer Look at Copper HDO

- Most recently standardized by AWWPA
- AWWPA standards above-ground only
- Used in Europe
- EPA registration is pending
- Not currently available





Environmental Concerns with CCA Alternatives

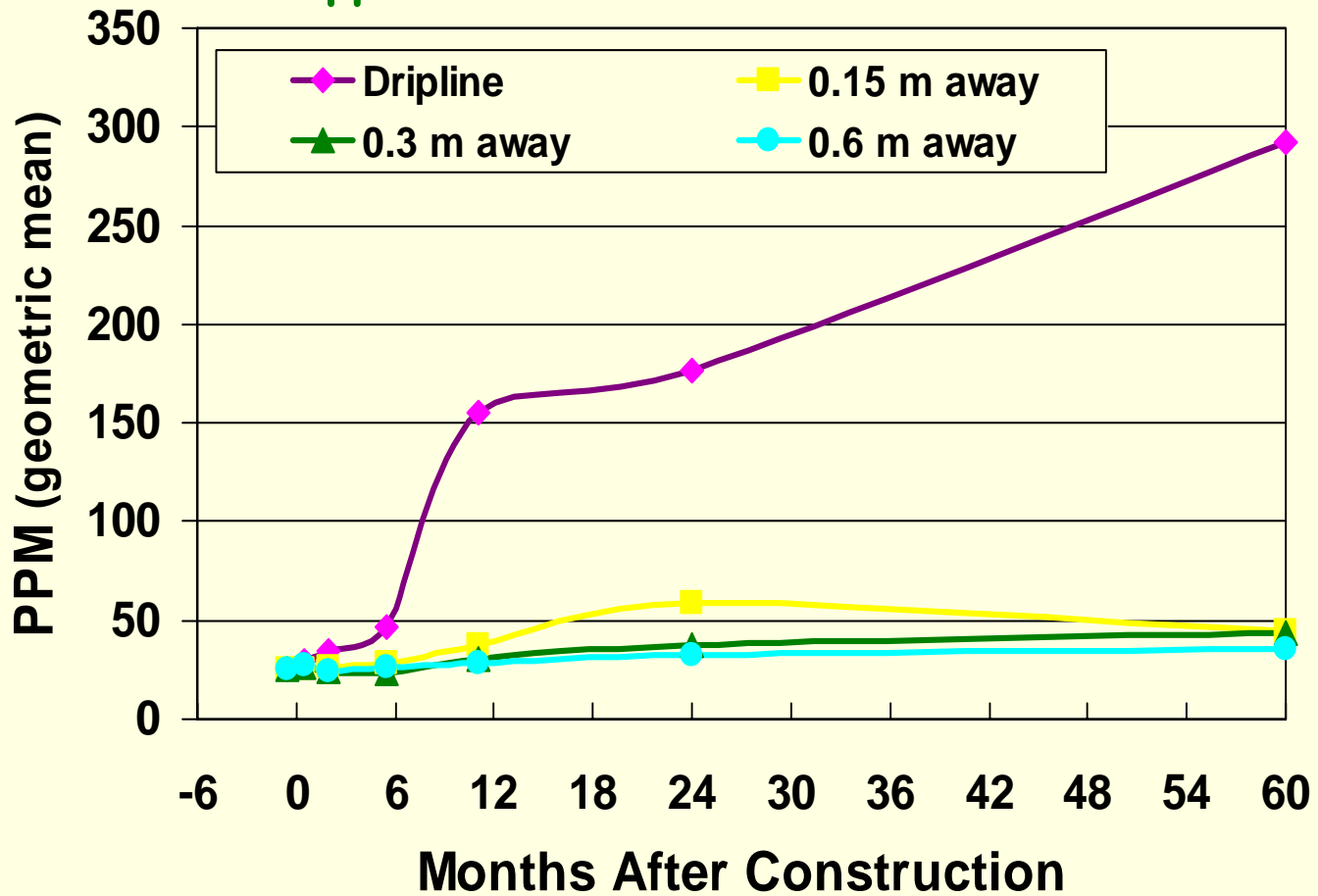
- Forest Service evaluation
- In-service wetland boardwalk
- Soil and sediment samples over time
- Aquatic invertebrates monitored





Copper Release

Copper Soil Levels: CCA Alternative





Environmental Concerns with CCA Alternatives

- Potential release of more copper into the environment, but...
- People are comfortable with copper
 - Water pipes
 - Pots and pans
 - Coins
 - Jewelry
 - Etc...





What if Copper is Withdrawn?

- Heavy-metal environmental concerns
- Non-metallic preservatives are being studied:
 - Chemical costs usually higher
 - Effective against narrower range of organisms?
 - Resistance to biodegradation?



Without Copper, Partitioning of Market is Likely

- Separation of above-ground and in-ground applications
- Separation by geographic region
- Changes in the way treated wood is retailed
- Education of users will be needed





Some Prospects

- Azoles
 - Propiconazole
 - Tebuconazole
- Isothiazolones
- Quaternary ammonium compounds
 - DDAC
 - ABAC
- Fixed or “slow release” borates





More Experimental...

- Water-repellents
- Agricultural pesticides
- Synergistic compounds
- Wood Modification
- Anti-oxidants
- And many more...





Treated Wood is Not the Only Choice

- Naturally durable species for decking
- Wood-plastic composites
- Straight Plastic
- Heavy Duty
 - Concrete
 - Steel





Specification and Quality Control

More important than ever with rapid changes in preservatives





Specification is a Little Tougher

- Treated wood is getting more complicated
- More types of preservatives
- More retentions
- Preservative and retention more closely matched to end-use
- End-tags usually provide guidance



Examples of End-tags





More End-tags... Mixed Stack





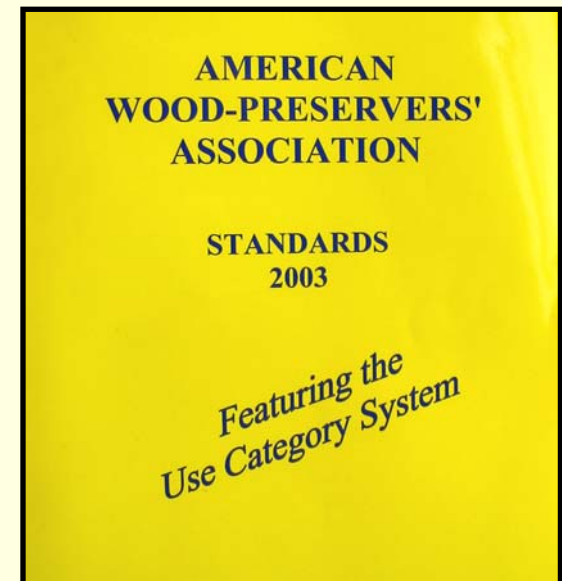
More End-tags... Mixed Stack





USE CATEGORY SYSTEM

- New format for Treatment Standards
- Based on Biodeterioration Hazard for treated product
- Simplifies for specifiers and users
- Seven use categories
- Includes fire protection





Summary

- Residential uses of CCA will be limited
- CCA replacements are becoming widely available
- Copper is the primary ingredient of alternatives
- Increased partitioning of market is likely
- Specifying treatments will be more important and more complicated



Thank You!

Questions?

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