



Creating forest sector solutions

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Mobility of Cu from MCQ in Shell-Treated Wood Exposed Above Ground

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Canadian Wood

- Most Canadian lumber is difficult to treat with water-based preservatives without incising
- Shell-treatments often used

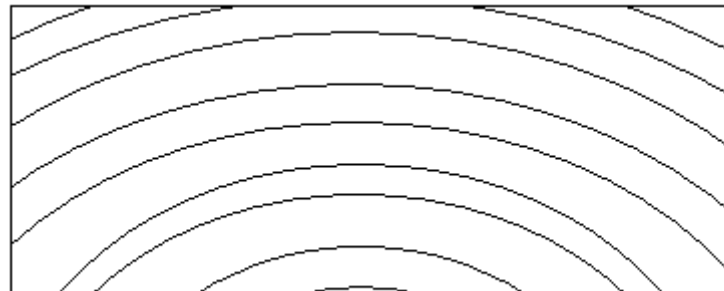


Canadian Treated Wood Performance

- Refractory species treated with a thin shell of CCA exceeded performance expectations
- Checks exposing untreated wood did not lead to rapid early failure

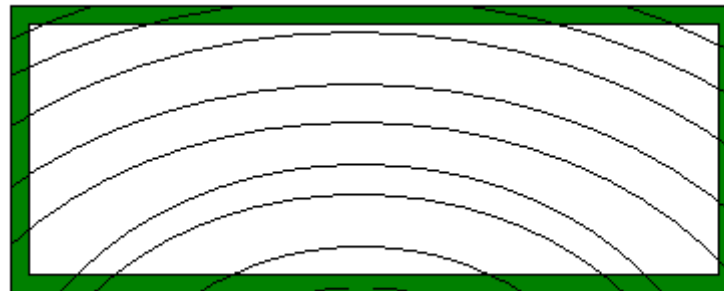
Protection of Shell-Treated Wood

Refractory wood



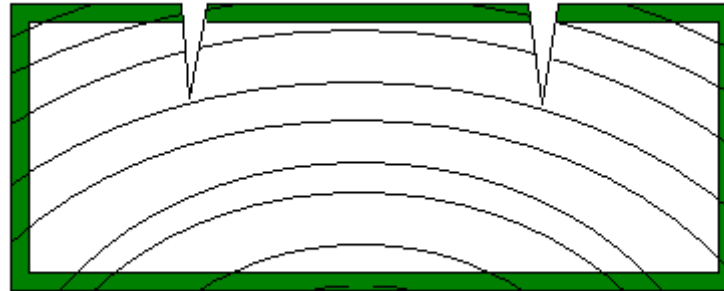
Protection of Shell-Treated Wood

Shell-treatment



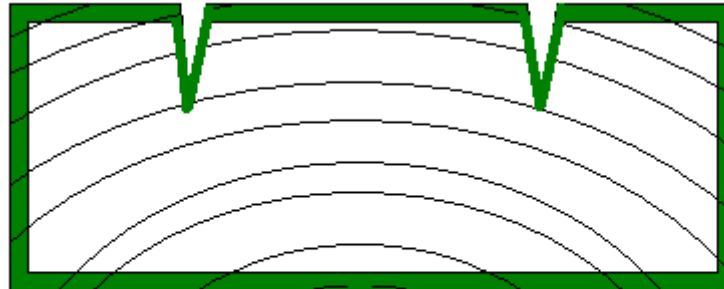
Protection of Shell-Treated Wood

In service checking



Protection of Shell-Treated Wood

Preservative re-distribution into checks



Mobility of Copper in Shell-Treated Wood

- Cu from CCA-treated wood was mobile and re-distributed into checks
- Checks also protected by Cu from copper-ethanolamine systems

Micronized Copper Preservatives

- Particulate basic copper carbonate
- Co-biocide (typically quats or azoles)
- Low solubility
- Demonstrated Cu mobility in Southern pine

Micronized Copper in Shell-Treatments

- Does Cu from wood shell-treated with micronized copper preservatives move into checks?
- Is copper mobility sufficient to protect exposed, untreated wood from basidiospore germination?

Materials

- White spruce (*Picea glauca*)
- Pressure treated with 1.8% solution of MCQ
- Average gauge retention 1.4 kg m⁻³
- Very poor penetration
- Boards end sealed & set up over basins
- Vancouver exposure

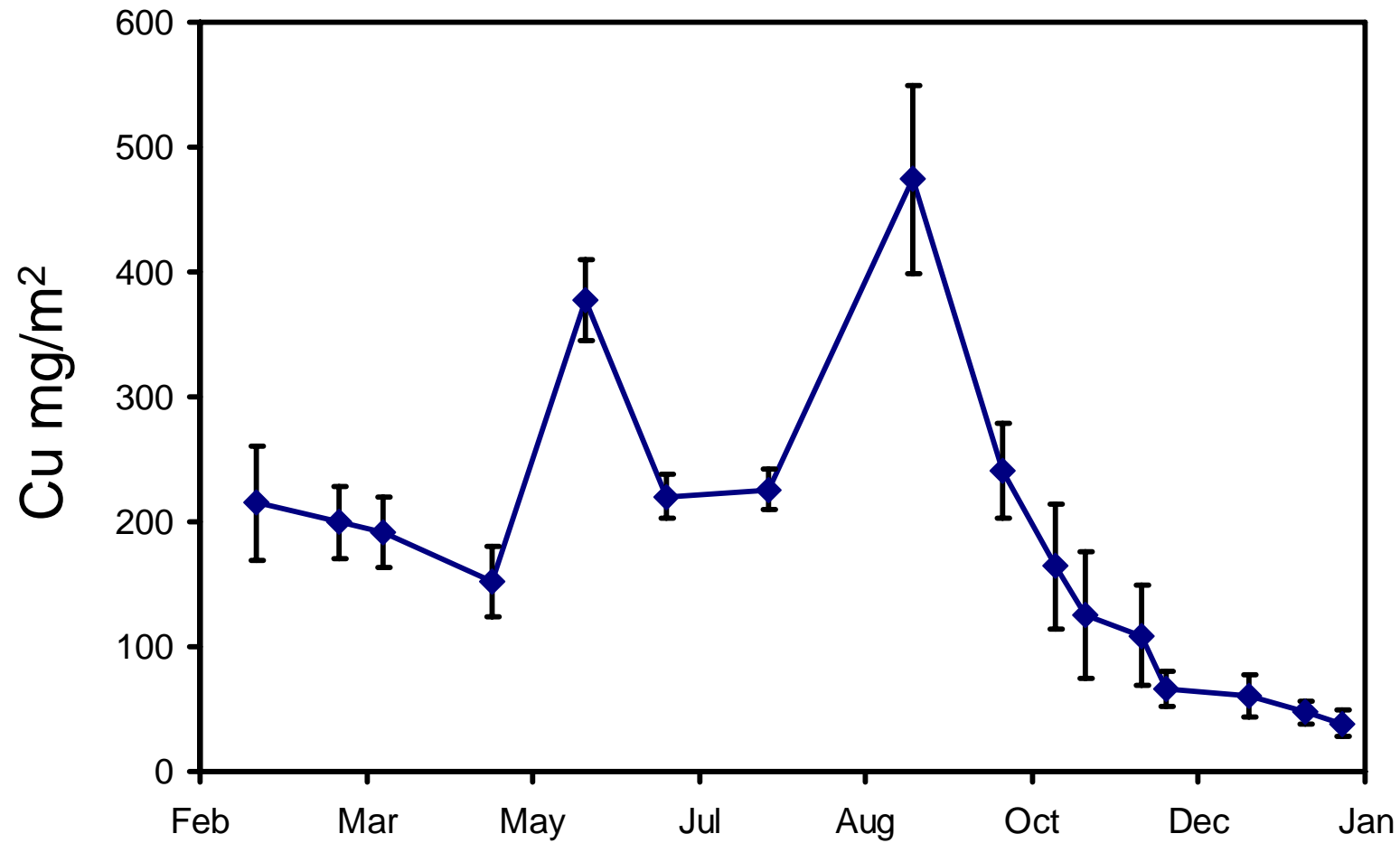


As per Choi *et al.*, 2004; Ruddick, 2008

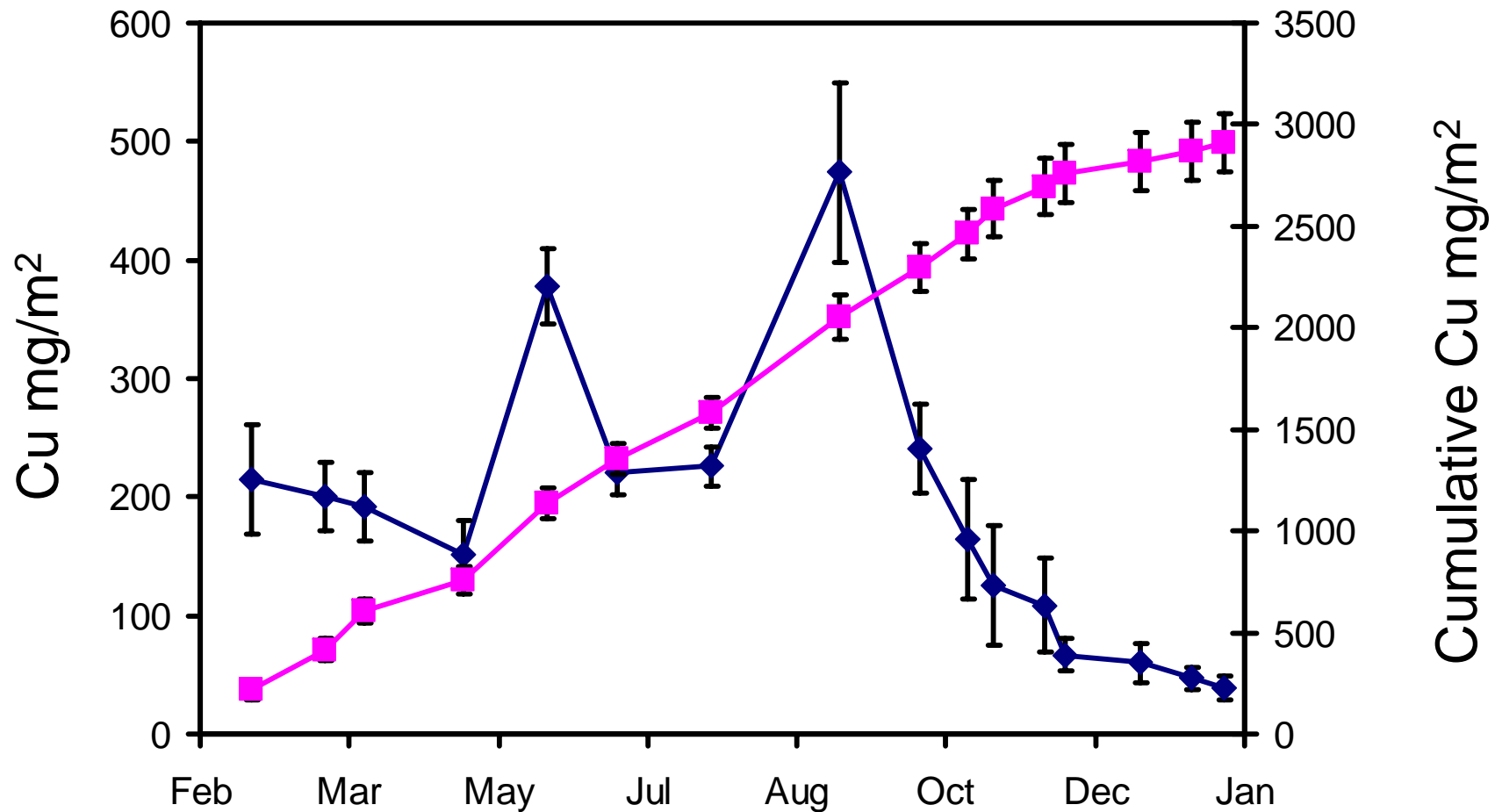
Methods

- Leachate collected monthly or when basins full
- Analysed for Cu by ICP-ES or ICP-MS
- Checks sampled after 5 and 12 months
- Check samples digested in acid and analysed for Cu by ICP-ES or ICP-MS

Results – Copper Leaching



Results – Cumulative Copper Leaching

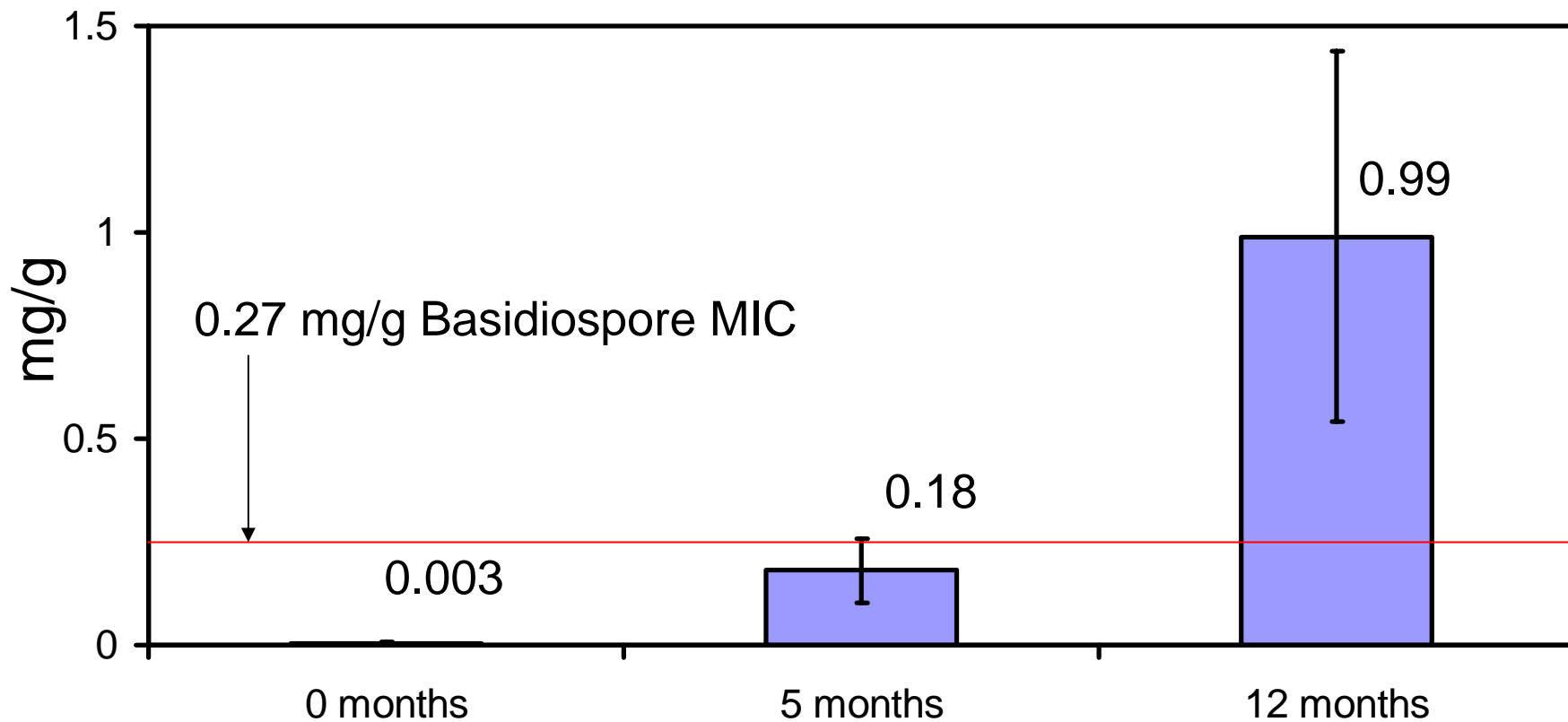


Leachate Summary

- Significant copper mobility
- Linear cumulative loss of copper, followed by gradual decline
- Difficult to compare with data from other systems

Cu Migration into Checks

- Significant checking after 5 mo.; similar after 12
- Increased [Cu] after 5 and 12 months



Conclusion

- Mobile copper from wood shell-treated with MCQ re-distributes into checks
- After 5 month's exposure [Cu] less than reported toxic thresholds
- After 12 month's exposure [Cu] greater than reported toxic thresholds

Acknowledgements

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