

# ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

*A tool for understanding environmental decisions related to the pulp and paper industry*



## EFFECTS OF NON-WOOD FIBER USE ON LAND AND WOOD USE

WOOD USE

### Land Disturbance

A fundamental distinction between agriculture and silviculture is the frequency, extent, and intensity of land disturbance. Unlike the annual rotation of agricultural cropland, silvicultural management involves rotations of 10 to 20 years or longer. Silvicultural management would involve site intervention a handful of times over that lengthy period, for site preparation, planting, suppression of unwanted vegetation, and harvesting. An agricultural crop could require as many as twice that number of interventions—every year. Annual crop rotation and the associated frequency of soil disturbance exact a toll on the structure of agricultural soils. Among the results are diminished soil porosity and slower water infiltration rates. Silvicultural practices, even when intensive, impose a lighter touch. The larger numbers of root channels extending into subsoil, and a higher content of large soil pores contribute to greater rates of water infiltration and percolation than is the case for agricultural soils. Therefore, there is diminished runoff and soil erosion potential associated with forestlands than with agricultural lands.

Because of the more intensive nature of agricultural practice, soil nutrients removed with the harvest must be replenished to sustain productivity. Kenaf, the most commonly cited non-wood option for papermaking, requires fertilization to achieve desirable yields. Crop residues, which have the inherent advantage of having been derived from an existing crop, are typically left on the land surface, burned, or incorporated back into the soil to restore soil organic matter. Appropriating the residue as a source of agricultural fiber must be balanced against environmental impacts (soil erosion), maintaining soil carbon levels (sequestration of greenhouse gases), and preserving or enhancing productivity (soil tillage and nutrient cycling). Additional fertilization is required depending on the extent of residue recovery, to sustain soil productivity.

Unlike the annual treatments required for agricultural crops, forestlands normally receive zero to three chemical applications during a rotation of 10 to 25 years, depending on tree species and region. In some regions, forestlands receive no chemical treatment. In cases where chemicals are applied to forestlands, they are used to enhance tree growth, reduce unwanted competitive vegetation, and control diseases and insects. Overall, the amount of chemical use in forestry settings is an order of magnitude less than in agricultural uses.

### Recommended Reading

Conservatree. n.d. Environmental Paper Listening Study Question 42: What is the comparison of impacts between agricultural residues and on-purpose crops?  
<http://www.conservatree.org/paperlisteningstudy/TreeFree/question42.html>

Blann, K. 2006. *Habitat in agricultural landscapes: How much is enough? A state-of-the-science literature review*. Washington, DC: Defenders of Wildlife.  
[http://www.defenders.org/resources/publications/programs\\_and\\_policy/biodiversity\\_partners/habitat\\_in\\_agricultural\\_landscapes.pdf](http://www.defenders.org/resources/publications/programs_and_policy/biodiversity_partners/habitat_in_agricultural_landscapes.pdf)

National Council for Air and Stream Improvement, Inc. (NCASI). 2006. *A primer on the top ten forest environmental and sustainability issues in the southern United States*. Special Report No. 06-06. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc.