ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

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

GREENHOUSE GASES

EFFECTS OF NON-WOOD FIBER USE ON GREENHOUSE GAS EMISSIONS

Role of Irrigation and Fertilization

The energy requirements that accompany the irrigation of agricultural land are addressed under the "Energy" section of the Non-Wood Fiber tab of this Tool.

The extent to which the manufacture of fertilizers consumes fossil fuels of significance to greenhouse gas emissions has been discussed previously under Energy. Their agricultural use imposes an additional burden through the release of nitrous oxide (N_2O). There is a lack of data from which to estimate fertilization related N_2O emissions. It is known that the conversion of forests and grasslands to croplands accelerates nitrogen cycling and increases nitrous oxide emissions from the soil. How much, however, remains uncertain. One study indicated that fertilization might increase N_2O emissions the equivalent of 86 to 321 metric tons per million acres per year (USDOE 1999). The impact of this estimated increase would be all the greater when considering that nitrous oxide has a global warming potential that is 300 times greater than CO_2. The N_2O emissions associated with cropland soil amendments are thought to be the largest net source of GHG emissions from cropland agriculture in the U.S. (USDA 2004).

Because wood fiber silvicultural practices rarely employ irrigation and involve significantly less reliance upon fertilization, related greenhouse gas emissions would be proportionately smaller relative to agricultural practices.

References

United States Department of Energy (USDOE). 1999. *Emissions of greenhouse gases in the United States 1998*. Appendix D. Report#:EIA/DOE-0573(98). Washington, DC: United States Department of Energy. http://www.eia.doe.gov/oiaf/1605/archive/gg99rpt/appendixd.html

United States Department of Agriculture (USDA). 2004. Cropland agriculture. Chapter 3 in *U.S. agriculture and forestry greenhouse gas inventory 1990-2001*. Technical Bulletin No. 1907. Washington, DC: U.S. Department of Agriculture Global Change Program Office, Office of the Chief Economist. http://www.usda.gov/oce/climate_change/AFGG_Inventory/gg_inventory.htm