Insulation for Greener Buildings

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The purpose of this research was to investigate the effectiveness of insulating materials with a smaller carbon footprint. I hypothesized that sheep wool would be the most effective insulation of the materials that I planned to test. A test box with double walls constructed from plywood was used to the different types of insulation five centimeters (2 inches) of each insulating material was added to the walls and floor, and 6.4 centimeters (2.5 inches) of insulating material was added to the ceiling of the box. After the box was filled with insulation, a beaker filled with 1000 ml of hot water (86 degrees Celsius) was placed inside the test box. The water temperature was measured in two hours intervals. The decrease in temperature was observed and recorded for each type of insulation. My hypothesis was confirmed, sheep wool insulation kept the water in the test box warmer than the other types of insulation. Hemp insulation was also effective but slightly less so than sheep wool and R-15 fiberglass insulation (positive control). Both sheep wool and hemp fiber are renewable resources. In addition, industrial hemp absorbs carbon dioxide while growing. The absorbed carbon dioxide becomes locked within the hemp's fiber, and hemp remains a carbon sink after it is harvested.

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