

## **Greenhouse Floors- Insulating**

There are many misconceptions about the need to insulate greenhouse floors in cold climates. In general, the *horizontal* floor area should not be insulated, while a *vertical* area under the greenhouse sides (perimeter) should be insulated. The following points, with references, should help provide the facts on this issue.

1. **Warm air rises, cool air sinks**, and thus the floor is not a significant source of greenhouse heat loss. <http://www.sare.org/Learning-Center/Courses-and-Curricula/Greenhouse-Energy-Conservation-Strategies-and-Alternative-Fuels> note: if you open a door in your house in the winter, you do indeed feel the cold air coming in at the bottom. However, this is primarily because the heated air is escaping at the top of the door. ..
2. **Greenhouse Heat Loss Factors:**  
Roof: 68%, Infiltration: 21%, side walls: 9%, gable ends: 2% =100%  
(note: "*floor loss*" is not a factor mentioned)  
[http://hrt.msu.edu/Energy/Notebook/pdf/Sec3/Reducing\\_Energy\\_Costs\\_in\\_California\\_Greenhouses.pdf](http://hrt.msu.edu/Energy/Notebook/pdf/Sec3/Reducing_Energy_Costs_in_California_Greenhouses.pdf)  
[http://hrt.msu.edu/Energy/Notebook/pdf/Sec3/Lower\\_Your\\_Energy\\_Bill\\_by\\_AJ\\_Both.pdf](http://hrt.msu.edu/Energy/Notebook/pdf/Sec3/Lower_Your_Energy_Bill_by_AJ_Both.pdf)
3. **Canada-Greenhouse Floors** Alberta (Canada) Department of Agriculture-  
Greenhouse floors- no insulation is recommended.  
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/opp2892](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/opp2892)  
  
Note: some building codes for residential homes require floor insulation. However, this requirement/ need, is not required, or desired, for greenhouses.
4. **Perimeter Insulation:** two feet deep, 2 inch thick foam board, vertically under walls.  
<http://aesop.rutgers.edu/~horteng/openroof1.htm>
5. **Floor Heat Sink:** Insulating the horizontal area of greenhouse floors is counterproductive in cold climates in the winter. During this period, the non-insulated horizontal floor area provides a heat sink for the daytime heat gain, to be released at night. <http://www.sare.org/Learning-Center/Courses-and-Curricula/Greenhouse-Energy-Conservation-Strategies-and-Alternative-Fuels>
6. **Minnesota Recommendations** "Energy Conservation Opportunities for Greenhouse Structures"- No mention of *horizontal floor insulation* as conserving energy.  
[http://www.state.mn.us/mn/externalDocs/Commerce/Energy\\_Conservation\\_for\\_Greenhouses\\_120503035439\\_EnergyConservationforGreenhouses.pdf](http://www.state.mn.us/mn/externalDocs/Commerce/Energy_Conservation_for_Greenhouses_120503035439_EnergyConservationforGreenhouses.pdf)

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