## Earth Cooled Air

A trench about 20' long by 2' deep was made for a length of 4" perforated drain pipe. One end led to the interior of a structure to be cooled, and the other end accessed surface air in a shady location. After and initial dampening, The soil was compacted as the trench was back-filled.



A fan powered by a solar electric panel was fitted into the end of the pipe within the structure.





On July 1<sup>st</sup>, 1023, with an outside ambient temperature of 109 degrees,, the air coming out of the pipe was 95 degrees – 14 degrees cooler. Keep in mind that this measurement was made immediately after a fan was turned on, so data on how long the air would remain how much cooler, remains to be taken.



| Earth      | INITIAL          |               |            |                 |
|------------|------------------|---------------|------------|-----------------|
| Cooling    | TESTING          |               |            |                 |
| Time       | Tamb             | Tout          | $\Delta T$ |                 |
| 2:00       | 98.6             | 87.2          | 11.4       |                 |
| 3:00       | 99.1             | 90.6          | 8.5        |                 |
| 4:30       | 99.7             | 90.8          | 8.9        |                 |
| 5:00       | 94.6             | 88.7          | 5.9        |                 |
|            | Various day      | s and times   |            |                 |
| 12:00 am   | 94               | 84            | 10         |                 |
| 2:00 pm    | 105              | 94            | 11         |                 |
| 4:00 pm    | 107              | 94            | 13         |                 |
| 1:45 pm    | 105              | 90            | 15         |                 |
| Above read | ing after the su | rface had bee | en dampen  | ed night before |
| 4:00 pm    | 104              | 93            | 11         | (the next day)  |
| 3:00 pm    | 108              | 95            | 13         |                 |

Another opportunity to consider would be to include a circuit of pipe under a membrane - enhanced garden, as shown in this cross section of a trench format garden.

