



ThermoSoil® Root Warmer User Manual

Series 120/240 (Volt)

Congratulations on your choice to utilize the **ThermoSoil® Root Warmer System**, a new and unique solution designed to take your crop yield and quality to the next level by creating the optimum root zone growing conditions at significantly lower energy cost.

ThermoSoil Benefits

- Back-to-nature growing
- Stabilizes optimum root zone temperature
- Increases convective air flow in soil
- Improves aeration and air pruning of roots
- Creates a comfortable root zone environment
- Provides healthier roots
- Encourages disease-resistant roots
- Prevents condensation, mold & fungus
- Increases root strength & metabolic function
- Optimizes water & nutrient intake
- Increases product quality
- Increases product yield

The basic system consists of one or more ThermoSoil Root Warmers and a Dual Air/Soil Thermostat for independent temperature control of each Root Warmer. Direct wall plug or water-proof power connectors are available for easy connection of multiple systems and for scaling up to any size operation.



ThermoSoil Root Warmer - Series 120/240 Volt
With Dual Air/Soil Thermostat



Dual Air/Soil Thermostat

ThermoSoil® Root Warmer System Setup

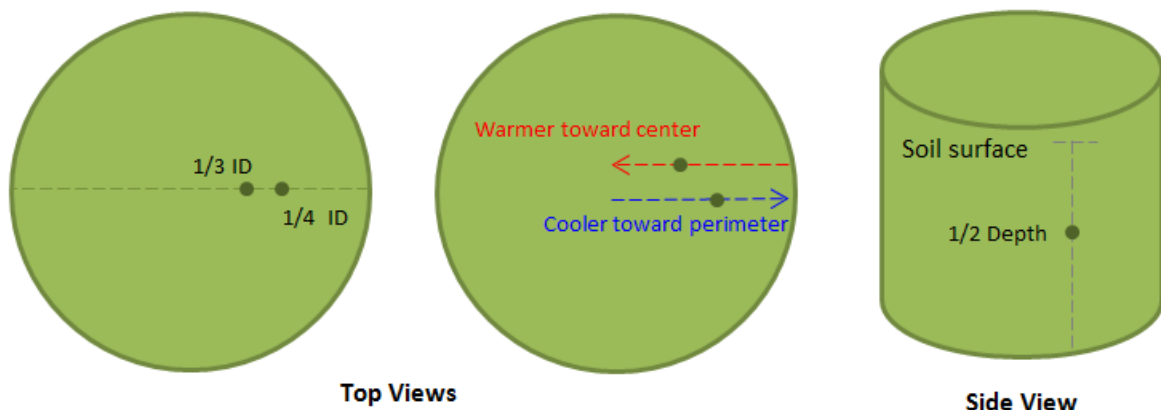
1. Select the ThermoSoil Root Warmer specified for the container size
2. Insert the Optional insulation fabric around the inside perimeter surface of the container
3. Insert the Root Warmer on the inside perimeter surface of the container with the thermostat module at the top of the container. Run the power cord so it is hanging over the edge, outside the container.
4. Make sure that the Root Warmer heating cables do not overlap.
5. Position containers and fill with soil or other growing medium. This will hold the heater in position. Repeat for all containers.
6. If using an interconnected system, connect ThermoSoil Root Warmers together, using the appropriate cable T- connectors. Rotate the connectors until the pins seat and firmly hand tighten the connector twist caps.
7. Plant the plants in the containers.

Make sure your ThermoSoil® Root Warmer System is always electrically connected to the Electric Ground and GFCI.

Dual Air/Soil Thermostat Setup

1. As a starting point, place the end tip of the Dual Air/Soil Thermostat into the soil approximately:
 - a. One-quarter to one-third of the container's inner diameter (ID) from the container perimeter toward the center of the container and
 - b. one-half of the distance from the soil surface to the container bottom (depth).
 - c. Refer to **FIGURE 1**.

FIGURE 1 Temperature Sensor Placement



2. The Dual Air/Soil Thermostat has factory-set limits to maintain root zone temperature between 68°F ambient air temperature and 75°F soil temperature.
3. As shown in Figure 1, adjust thermostat position as needed by moving the sensor:
 - a. toward the center to create warmer root zone temperatures.
 - b. toward the perimeter to create cooler root zone temperatures.

Connecting to Power

1. Root Warmer Series 120/240 can be hardwired or plugged into the appropriate electrical power source, either to 120-Volt or 240-Volt depending on the Voltage rating of the Root Warmers.
2. Each ThermoSoil® Root Warmer model has an Amp (current) rating. Check to insure that the total Amps of all Root Warmers connected to any one power source does not exceed the Amp rating of the power source. **See Table 1.**

WARNING: The heating cables of ThermoSoil® Root Warmer must be always immersed in the soil. Long time exposure of the heating cable in the open air and to the light may result in damaging the heating cable insulation and malfunction of the heating product.

ThermoSoil Root Warmer – Series 120/240

TABLE 1 Electrical Specifications

Container Size in <u>Gallons</u>	<u>Amps @120V</u>	<u>Amps @240V</u>
20	0.63	0.31
30	0.85	0.42
45	1.01	0.50
65	1.20	0.60
100	1.62	0.81
150	2.15	1.08
200	2.62	1.31
300	3.16	1.58
400	3.69	1.85
500	4.12	2.06
600	4.55	2.27
700	4.92	2.46
800	5.24	2.62
900	5.56	2.78
1000	5.88	2.94

ThermoSoil® Root Warmer Operating Considerations

Increased Water and Nutrients

Be aware that other grow parameters may need to change while using ThermoSoil® Root Warmer systems. For example, soil at stable, optimum temperatures and improved convective air flow will be drier than before. Besides benefitting from reduced or eliminated condensation, mold, fungus and other diseases, this presents the grower with opportunity to increase and optimize water and nutrient uptake. Increased water and nutrient uptake may, in turn, result in increased plant metabolism, faster grow cycles and increased crop yield and quality.

Lower Ambient Temperature

Plants utilizing using ThermoSoil® Root Warmer Systems are better able to withstand drops in ambient temperature. This gives the grower opportunity to reduce ambient air heating costs especially at night in the flowering stage when lights are out. Experiment with gradual reductions in ambient temperature to determine the maximum energy savings potential of your operation. Plants using ThermoSoil should be erect and ready to receive nutrients in the morning one or two hours before plants not using the ThermoSoil system. This hour or two savings each morning could reduce time in the flowering stage.

ThermoSoil® Root Warmer System Care Instructions

1. ThermoSoil can be reused for multiple cycles within a two-year period. We recommend replacement of the ThermoSoil® Root Warmers after two years and the Dual Air/Soil Thermostat after one year because of the thermostat lifespan.
2. ThermoSoil Root Warmers are hermetically sealed and water proof. They can be washed or immersed in bleach solutions or other sanitizing solutions.
3. ThermoSoil Root Warmers can be put back into use immediately following washing. They do not need to dry.

ThermoSoil® Root Warmer System Warranty

ThermoSoil® Root Warmers are warranted for two (2) years and the Dual Air/Soil Thermostats for one (1) year. The following are excluded from the warranty:

- Products purchased as second-hand or used.
- Products purchased from an unauthorized retailer and distributor.
- Damage resulting from misuse and abusive action.
- Damage resulting from chemicals, fire, radio-active substance, poison, liquid except that ThermoSoil Root Warmers may be washed or immersed in water or bleach solutions or other sanitizing solutions.
- Damage resulted from natural disaster.
- Damage caused to any 3rd party / person / device and beyond.

If you encounter any problems with your ThermoSoil product during the warranty period, contact us for technical support and return material authorization (RMA) at 888-454-2236 or contact@thermosoil.com.