

## ThermoSoil<sup>®</sup> RootWarmer<sup>®</sup> Series 24 Starter Kit

Congratulations on your choice to utilize the **ThermoSoil<sup>®</sup> RootWarmer<sup>®</sup> 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<sup>®</sup> RootWarmer<sup>®</sup> 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
- Increases water & nutrient intake
- Increases product quality
- Increases product yield

The starter kit includes (4) ThermoSoil RootWarmers, (4) fabric pots, (1) transformer, (1) plug-in controller with GFCI. The starter kit is expandable to (6) RootWarmers as follows:

TABLE 1	Starter Kit	Add-on
RootWarmers:	4	2
Fabric Pots:	4	2
Connector port:	1 (4-port)	1 (3-port)
Transformer:	1	
Controller/GFCI:	1	

### ThermoSoil<sup>®</sup> RootWarmer<sup>®</sup> System Setup

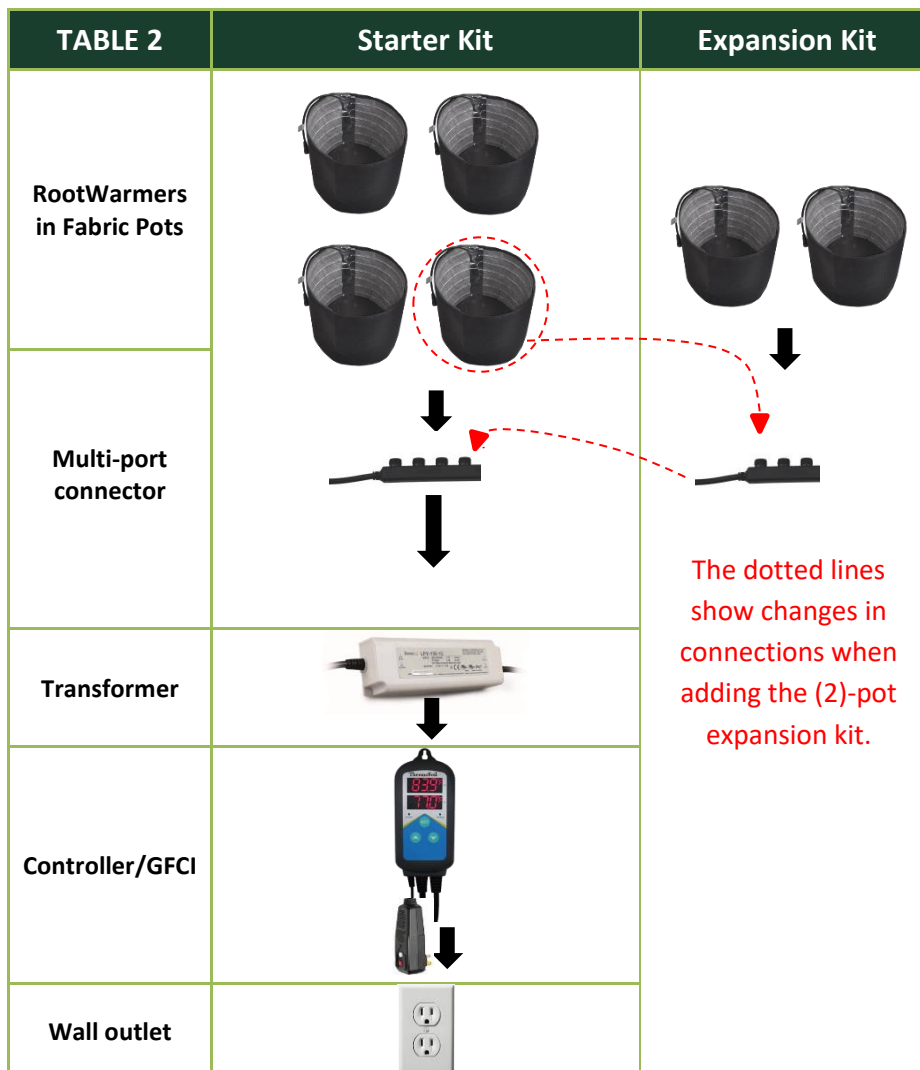
1. Wrap the ThermoSoil heating insert on the inside of the fabric pot with the power cord hanging over the top edge outside the fabric pot.
2. Make sure that the RootWarmer heating elements do not overlap.
3. Fill the fabric pot with soil or other growing medium. This will hold the heater in position.
4. Repeat for all containers.
5. Using then appropriate connectors, connect (4) ThermoSoil RootWarmers to the 4-port connector, to the transformer and to the controller with GFCI plug as shown in **TABLE 2**.
6. Rotate the connectors until the pins seat and firmly hand tighten the twist cap.
7. Plant the plants in the containers.

8. Select a representative container for placement of the controller's temperature sensor.
9. Place the temperature sensor into the soil approximately:
  - One-quarter to one-third of the container's diameter from the container perimeter toward the center of the container and
  - One-half of the distance from the soil surface to the container bottom (depth).
  - Refer to **FIGURE 1** (next page).
10. Plug controller/GFCI into a 120-Volt outlet.
11. Refer to controller operating instructions for setting temperature and operating the controller.

**Optional Expansion Kit:**

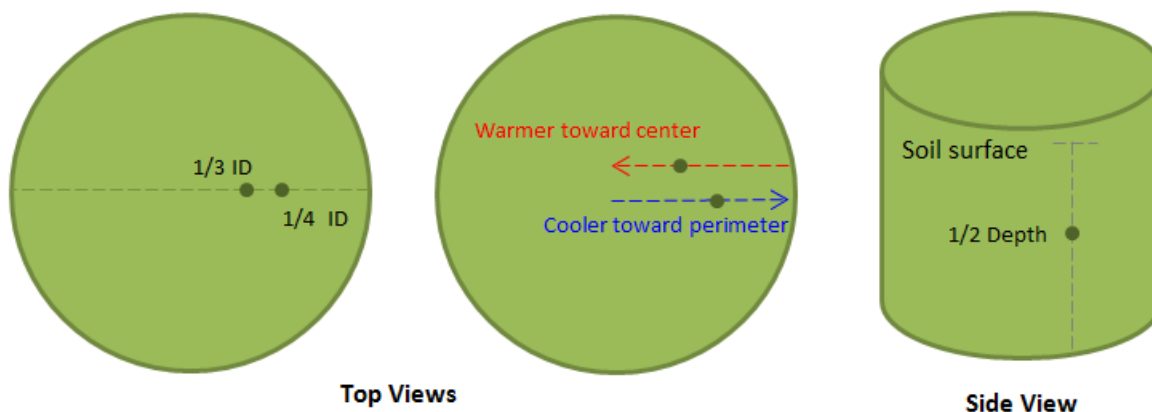
The optional expansion kit allows for adding (2) RootWarmers and (2) fabric containers with an additional 3-port connector. To connect the expansion kit:

1. Disconnect one of the four RootWarmers from the 4-port connector.
2. Connect the 3-port connector from the expansion kit into the free port in the 6-port connector.
3. Plug the remaining (3) RootWarmers, (1) original and (2) add-ons, into the 3-port connector.



**FIGURE 1**

**Temperature Sensor Placement**



### ThermoSoil® RootWarmer® Operating Considerations

#### Increased Water and Nutrients

Be aware that other grow parameters may need to change while using ThermoSoil RootWarmer 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 water and nutrient uptake. Increased water and nutrient uptake may, in turn, result in faster grow cycles and increased crop yield and quality. Refer to **TABLE 3** for optimum soil temperatures for various vegetables.

#### Lower Ambient Temperature

Plants utilizing ThermoSoil RootWarmer 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.

**TABLE 3** Soil Temperatures for Vegetable Seed Germination  
Optimum Degrees F, (Optimum Range)

Asparagus	75, (60-85)	Cucumber	95, (60-95)	Pepper	85, (65-95)
Bean	80, (60-85)	Eggplant	85, (75-90)	Pumpkin	95, (70-90)
Beet	85, (50-85)	Lettuce	75, (40-80)	Radish	85, (45-90)
Cabbage	85, (45-95)	Muskmelon	90, (75-95)	Spinach	70, (45-75)
Carrot	80, (45-85)	Onion	75, (50-95)	Squash	95, (70-95)
Cauliflower	80, (45-85)	Parsley	75, (50-85)	Tomato	85, (60-85)
Chard, Swiss	85, (50-85)	Parsnip	65, (50-70)	Turnip	85, (60-105)
Corn	95, (60-95)	Pea	75, (40-75)	Watermelon	95, (70-95)

## ThermoSoil® RootWarmer® System Care Instructions

1. ThermoSoil RootWarmers can be used for multiple cycles if used properly according to this manual.
2. ThermoSoil RootWarmers are hermetically sealed and waterproof. However, they are not designed to be immersed and function in water.
3. Avoid puncturing or cutting ThermoSoil RootWarmers with sharp or overweight objects.
4. Any cutting or mechanical damage of ThermoSoil RootWarmers or the heating elements will result in malfunction or destruction of the heater and voiding the warranty.
5. Please do not attempt to repair ThermoSoil RootWarmers. Contact the manufacturer for assistance.
6. Do not fold ThermoSoil RootWarmer Mats™ more than 90° during use, storage or transportation.
7. See separate controller use and care instructions.

### Caution

**Do Not** install any sharp, spike-like objects into the soil while the heating system is energized.

## ThermoSoil® RootWarmer® System Warranty

ThermoSoil Root Warmers are warranted for (1) year and the controller for (3) years.

The following are excluded from the warranty:

- Products purchased as second-hand or used
- Products purchased from unauthorized retailer and distributor
- Damage resulting from misuse and abusive action
- Damage resulting from chemicals, fire, radio-active substance or poison.
- 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 time period, contact us for technical support and return material authorization (RMA) at 888-454-2236 or [contact@thermosoil.com](mailto:contact@thermosoil.com).