



## Help Protect Plants from Freezing

Modifying the soil to capture and retain more heat is a way growers can reduce spring freeze injury. Weed-free soil retains more heat than freshly cultivated or unmowed sites and a few degrees may make a difference this spring.

Cover crops also shade the soil resulting in cooler soils during radiation frosts. Keeping the soil surface clean of vegetation allows it to absorb more heat during the day. Soils have a large heat capacity, so they can capture and store considerable heat during sunny days. This heat can maintain warmer air temperatures during cold nights. Weeds and sod insulate the soil surface from the sun. In addition, tall, unmowed cover crops raise the effective ground level, so even higher flower buds may be injured where there is a tall stand of grass or weeds.

Wet or moist soils have a higher heat capacity than dry soils, and packed soils are able to absorb more heat than recently cultivated soils. This means that clean, moist, and packed soil surfaces will absorb more radiant energy during the day, and protect from frost by releasing this heat during the night.

Source: [http://msue.anr.msu.edu/news/moist\\_weed\\_free\\_soil\\_retains\\_more\\_heat](http://msue.anr.msu.edu/news/moist_weed_free_soil_retains_more_heat)

**Irrigate before the frost** – A moist soil can hold four times more heat than a dry soil. It will also conduct heat to the soil surface faster than a dry soil, aiding in frost prevention. In a study performed years ago, the air temperature above a wet soil was 5° F higher than that above a dry soil and the difference was maintained until 6 a.m. the next morning. Thus, plants should be well watered the evening before a frost. Cover your plants – Covering plants can give you 2 to 5° F protection. The covers can be laid right over the crop, or can be supported on stakes. The difference being that protection is less wherever the cover touches the plant. Any material can be used to cover the plants, however woven fabrics are better insulators than plastics or paper. The best time to apply covers is in the late afternoon after the wind has died down. Remove covers the next morning before the sun hits them. Irrigate during the potential frost – Many people claim that watering the frost off plants prevents frost damage. This is partially true. As mentioned above, watering plants helps raise their temperature and the air around them to that of the water. In addition, as water freezes, heat is released; 80 calories for each gram of water that freezes. Therefore, watering plants before they are injured from frost can help keep their internal temperature above freezing.

Source: <http://www.gardening.cornell.edu/weather/frost.pdf>