

# Using Soil Temperature Reports for Turf Management

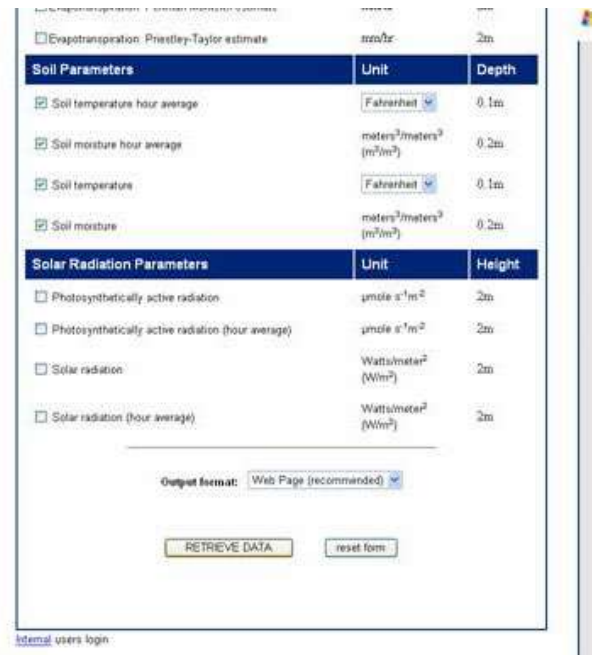
NOTE: portions taken from a TCNC article written by Greg Johnson, Meteorologist and Art Bruneau, Turfgrass Specialist

Soil temperature reports from around the state are available at: <http://www.nc-climate.ncsu.edu/jet/>. These reports can be accessed by following the instructions below:

1. **Select ECONet**
2. **Select the town/county or area nearest to you.**
3. **Select the retrieve data button**



1. **Scroll down to Soil Parameters.**
2. **Select soil temperature information.**
3. **Click on the Retrieve Data button.**



- **Summary page of your Soil Temperatures is produced**

**Station:** [SILR](#) - Siler City Airport      **Date of first observation:** 2000-10-24

**Station type:** ECONET - Tower

**City, State:** Siler City, NC      **County:** Chatham County


**Latitude:** 35.68°      **Longitude:** -79.5°

**Elevation:** 870 feet above sea level

**Climate division:** NC04 - Central Piedmont

**River basin:** Cape Fear

**Supported by:** NC DENR Air Quality



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**Retrieving hourly data from Siler City Airport for past 1 day(s)**  
38 observations for this period of record (87.4% data available, 1 missing records)  
 If you need more historical data from a larger period of record, please [contact us](#) for assistance.

Date/Time of ob (Eastern Standard Time)	Average Soil Temperature (F)	Soil Temperature (F)	Soil Moisture (m <sup>3</sup> /m <sup>3</sup> )	Average Soil Moisture (m <sup>3</sup> /m <sup>3</sup> )
03/28/2005 01:00	53	53	0.3340	0.3270
03/28/2005 02:00	53.1	53.2	0.3510	0.3440
03/28/2005 03:00	53.2	53.2	0.3510	0.3500
03/28/2005 04:00	53.3	53.3	0.3520	0.3520
03/28/2005 05:00	53.5	53.6	0.3600	0.3540
03/28/2005 06:00	53.7	53.9	0.3930	0.3910
03/28/2005 07:00	54.3	54.7	0.4010	0.3840
03/28/2005 08:00	55	55.2	0.3630	0.3850
03/28/2005 09:00	55.5	55.9	0.3290	0.4120
03/28/2005 10:00	56.2	56.7	0.3130	0.3170
03/28/2005 11:00	57.2	57.8	0.3060	0.3090
03/28/2005 12:00	58.3	58.7	0.3030	0.3040
03/28/2005 13:00	58.8	58.6	0.2490	0.2800
03/28/2005 14:00	58.3	58	0.1980	0.2390
03/28/2005 15:00	58	57.9	0.2020	0.2010

## Using Soil Temperature Reports

In general, turf-covered areas will warm more slowly in the spring and cool down more slowly in the fall on any given day as opposed to bare ground. In addition, there is less chance of reaching extreme high and low temperatures on any given day or season because of the buffering effect provided by the vegetation. The differences should be less pronounced on cloudy, windy days, with turf-covered areas staying somewhat warmer than bare ground after the passage of a strong cold front. Areas with sparse vegetation (new seedlings or thin turf) would expect to have temperatures approaching those reported for bare ground more so than areas with a dense turf cover.

Soil temperatures under turf-covered areas can be 1 to 4 days behind the temperatures reported by the Extension Service. This can be an advantage for turf managers because time can be allotted for planning. For example, goosegrass and spurge usually germinate when soil temperatures approach 60°F in the spring. A turf manager monitoring the soil temperatures reported for bare ground will know that (s)he may have several days grace to apply preemergent herbicides even though the reported soil temperature is 60°F. Soils that are sandy will reduce this grace period.

The following is a partial list of soil temperatures (°F) at the 4-inch depth that should be of the association with certain biological events.

### Turfgrass Growth and Development, [Art Bruneau](#)

#### Cool Season Grasses

- 90°F              Shoot growth ceases.
- 77°F              Root growth ceases.
- 70°F              Maximum temperature for root growth of any consequence.
- 70°F              Time to plant grasses in late summer.
- 60-75°F          Optimum temperature for shoot growth.
- 50-65°F          Optimum temperature for root growth.
- 40°F              Shoot growth ceases.
- 33°F              Root growth ceases.
- 20°F              Low temperature kill possible if temperature subsequently drops rapidly below 20°F

## Warm Season Grasses

120°F	Shoot growth ceases.
110°F	Root growth ceases.
80-90°F	Optimum shoot growth.
75-85°F	Optimum root growth.
74°F	Optimum time to overseed bermudagrass with ryegrass in the fall. Time to plant grasses in the spring.
64°F	Expected spring root decline is triggered and roots turn brown and die within 1 or 2 days.
50°F	Root growth begins to slow below this temperature.
50°F	Chilling injury resulting in discoloration is possible.
50°F	Initiation of dormancy occurs resulting in discoloration.
25°F	Low temperature kill possible.

## Weed Control, [Fred Yelverton](#)

60-65°F	Germination of spurge and goosegrass is expected, therefore, apply preemergent material when soil temperatures approach this level.
53-58°F	Germination of crabgrass is expected, therefore, apply preemergent material when soil temperatures approach this level.

## Insect Control, [Rick Brandenburg](#)

55°F	Minimum temperature for white grub and male cricket activity.
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## Disease Control, [Lane Tredway](#)

Soil temperature is a very important parameter for turf diseases, especially the root and crown diseases. Here are some examples of target soil temperature ranges for control of important root and crown diseases:

65°F	Summer Patch ( <i>Magnaporthe poae</i> ) - infects roots during spring and summer when soil temperatures are above 65°F
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40-60°F	Take-all Patch ( <i>Gaeumannomyces graminis</i> ) - infects roots during fall and spring when soil temperatures are between 40°F and 60°F. Fall applications most important for preventative control.
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60-80°F

**Spring Dead Spot (*Ophiosphaerella korrae*)** - infects bermudagrass roots in the fall when soil temperatures are between 60°F and 80°F. Preventative fungicide applications should be applied in this target zone.



70°F

**Large Patch (*Rhizoctonia solani*)** - begins to infect in fall when soil temperatures dip to 70F. Preventative applications should be targeted to this soil temperature.

