

# Spring Winterkill - diagnosis, creative and preventive strategies

## Diagnosis

1. **Crown Hydration** – occurs in late winter; annual bluegrass typically hydrates under high moisture conditions and cells rupture with a rapid drop in temperature. Creeping bentgrass remains dormant longer and is less susceptible to crown hydration damage. Removal of excessive surface moisture can prevent crown hydration – i.e. solid tine aeration and application of a soil surfactant in the late fall.
2. **Winter Desiccation** – is particularly damaging to exposed elevated turf; creeping bentgrass and annual bluegrass are extremely susceptible under these conditions.
3. **Direct Low Temperature** – impacts warm season grasses more than cool season varieties. Rapid temperature declines increase the susceptibility of turf damage.
4. **Ice Sheets** – lasting less than 150 days usually will not impact creeping bentgrass, but annual bluegrass will only tolerate up to 75 days. Breaking surface ice will alleviate potential for ice damage, along with solid tine aerification to release harmful gas accumulations in the soil profile.
5. **Snowmold** – can be prevented with late fall and winter fungicide applications.

**Turf Sample** – always sample distressed turf along with healthy turf from the same area; evaluate recovery potential under warmth and sunlight for at least 14 days.

## Creative strategies for recovery in the spring

### **Spring Recovery Activities**

- Sod damaged areas
- Inter-seed; weekly spiking and seeding
- Fertilize with Nature Safe 5-6-6
- Avoid early spring application of surfactants, high salt synthetic fertilizers and PGR's
- Apply Holganix at two-week intervals during recovery process when soil temperatures are at or above 50 degrees.
  - o Remediate anaerobic soils – re-oxygenate profile, balance biology to aerobic conditions

- Increase plant availability of key soil nutrients, vitamins and growth hormones
- Restore natural biological processes

### Preventive strategies for the fall

#### **Natural Plant Winter Hardening Process – early fall through early winter**

The plant naturally prepares itself for cold temperatures in the fall. Here's how the turf prepares:

- Plants store carbohydrates (sugars) in cells of crown and root tissue
  - Acts as anti-freeze
  - Provides stored energy for respiration during dormancy
- Cell walls thicken to resist water crystallization damage
- Moisture content of cells decreases

#### **Late Summer - Late Fall Applications of Holganix – continue Holganix applications until soil temperature reaches a consistent 50 degrees.**

- Facilitate carbohydrate storage
- Enhance uptake of K, Ca, Mg – salts that act as intracellular anti-freeze
- Increase cell wall integrity
- Improve soil structure and water management – promote uniform hydration and reduce compaction
- Increase root biomass – increase plant drought stress tolerance
- Reduce degradation of chlorophyll (Saccharomyces) – increased photosynthesis activity, energy storage

#### **Late Fall - Additional Supporting Activities – applied in conjunction with Holganix**

##### Tank Mix Combination with Holganix

- Potassium phosphite application – increase cell wall integrity and protect from crown hydration
- Supplemental K, Ca, Mg – insulate plant cells from crown hydration and direct low temperature damage
- Soil surfactant application to provide adequate soil hydration and reduce winter desiccation damage

##### Supplemental Activities

- Natural constructed or composted granular organic fertilizer – meal fortified or composted fertilizer that will sustain biology and not promote excessive foliar growth or cell moisture content
- Solid tine aerification to provide profile drainage and relieve any potential toxic gas accumulations from excessive ice accumulation