

## Critical Soil Temperature Concerns

By John McGregor, MFGA Extension Support

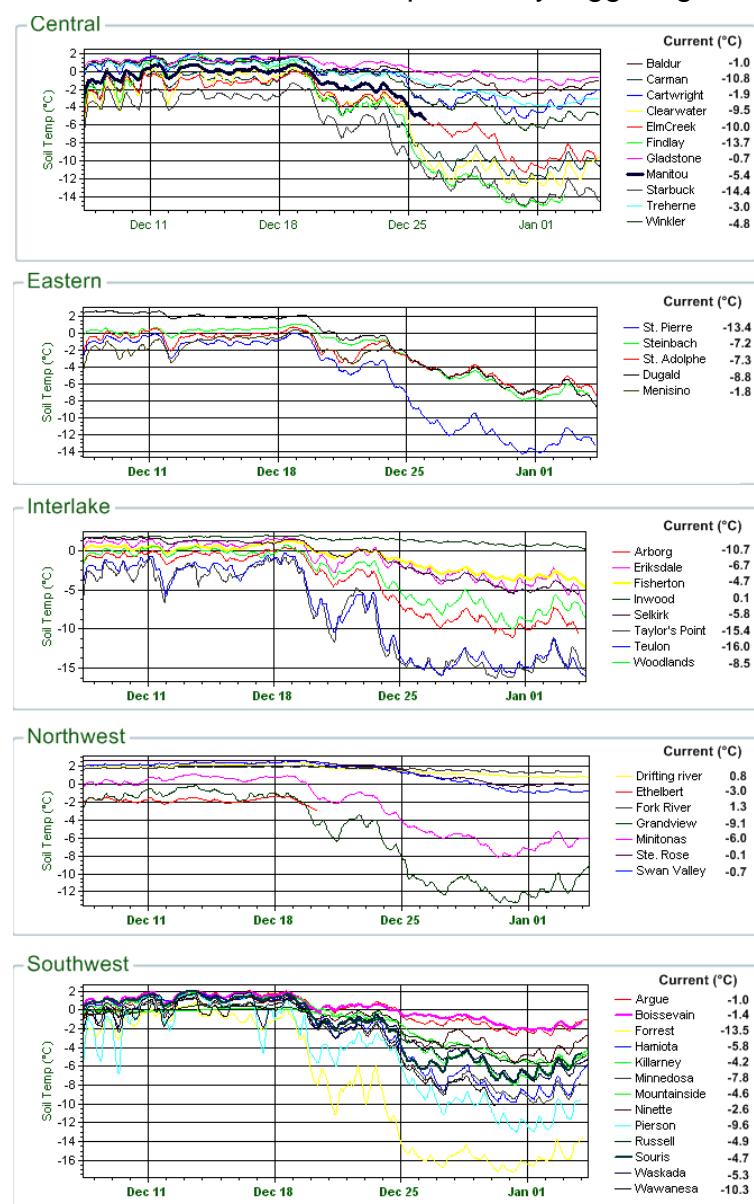
The variability of snowfall this winter and the recent “Polar Vortex” has many forage producers expressing concern with the survival of their alfalfa stands. We are starting to see soil temperatures across Manitoba drop into the critical range for alfalfa in a lot of areas.

As soil temperatures drop, the risk of winterkill to alfalfa greatly increases. Adding to this worry is the variability of snowfall accumulations on alfalfa fields potentially triggering the temperature of the crown to drop below the critical level.

Alfalfa, once dormant, can survive in soil temperatures up to -12 degrees Celsius. Below this temperature, water left within the alfalfa taproot and crown cells freezes and forms ice crystals that puncture the cell membranes. When the alfalfa roots thaw, the plants die because water and cell contents leak from the cells.

As for predicting winter-kill damage at this time of year, that's very difficult. If the plant is not fully dormant, or if the variety is less winter hardy, it can be injured or killed at temperatures above -12 and conversely if it is more winter hardy or fully dormant it may be able to withstand temperatures below -12 for short periods of time.

What we are seeing at the Mb Ag weather monitoring sites are soil temperatures (as of January 4<sup>th</sup>) approaching the -15 range in some areas. Most of the



monitoring sites are located on grass and therefore they simulate forage fields. Snow depth reports from Teulon are only 1-2 inches of snow cover and that station is reporting temperatures in the -15C range. Although these sites don't necessarily represent what is presently happening in your field, it does give a good indication as to what is happening in your particular area. As little as four inches of snow can mean soil is kept as much as 10 degrees Celsius warmer than the air temperature. Checking your fields for snow accumulation can provide a better idea on what may be happening on your particular fields.

For more information on understanding and reducing the risk of winterkill to your alfalfa click on [Winterkill Risks](#)



#### **Snow Cover Estimate (in inches):**

Eastern: 6-10 increasing in depth as you move east

Interlake: Teulon 1-2, Ashern-Arborg area 4-10

Central: Miami, Morden/ Winkler almost no snow, Plumas 8-12, more to the north

North-west: 18-24

Southwest: Virden 4, McAuley 4-6, Melita 0-2

*Special thanks to Darren Chapman, Alistair Pethick, David Single, Bill and Isabel Acheson and Curt Bossuyt and Mb Ag Staff -Pan Iwanchysko, Jane Thornton, Tim Clarke, Darren Bond and Peter Pettrash for providing information on snow depths.*

MANITOBA FORAGE & GRASSLAND ASSOCIATION