MINNESOTA TURF SEED COUNCIL
NEWSLETTER
May 9, 2017

PERENNIAL RYEGRASS GROWING DEGREE DAYS (GDD)

Ryegrass GDD will be tracked for the 2017 growing season with comparisons to the previous six years. A base temperature of 32 degrees F will be used for ryegrass (T-Base = 32 F)

Reported GDD are based on the total accumulation from the beginning of the calendar year to the current date. Thus far in 2017, we have accumulated 514 GDD as of May 7th (Table1). Last week the accumulated GDD was 139 (19.8/day) which is above the long term average 102 (14.9/day). Forecast for the week ending May 14th suggests a continuation of the warming trend as projected GDD accumulation of 148 (21.1/day) compared to the average of 124 (17.7/day).

Table 1. Growing degree days (GDD), March - May 2011 to March & April 2017 near Roseau MN.

Year	2017	2016	2015	2014	2013	2012	2011	2017 vs. 16
March	90	38	119	0	0	304	7	+52
April	285	263	367	159	80	370	278	+22
May		765	659	654	640	726	639	
May 1-7	139							
Total	514	1,066	1,145	813	720	1,400	924	
May 8-14*	148							

* Forecasted GDD at Roseau for the next 7 days.

GENERAL CROP CONDITION

Last week was a busy week for application of fertilizer in ryegrass and will continue this week. With the projected warm temperatures and good soil moisture perennial ryegrass will soon enter a period of very rapid growth. Perennial ryegrass, for the most part, is in the tillering stage of growth. The next critical stage of growth in perennial ryegrass is jointing. As a review, the following are the average GDD for the various stages of perennial ryegrass in northern MN. The GDD numbers below are averaged over various management systems (spring and fall seed,) at Roseau, MN.

Growth Stage	GDD
Greenup	<200
Tillering	200-700
Early Jointing	700-850
Late Jointing	900-1,050
Mid-heading	1,300-1,550
Pollen Shed	1,600-1,800
Swathing	2,700-2,900

CROP MANAGEMENT

Assessments for perennial ryegrass winterkill can be a challenge. The early snow melt this spring, (mid-March) had plants exposed to cold temperatures in early April, which resulted in perennial ryegrass leaf and crown desiccation. Ponding of water, ice sheeting, lack of snow cover and time of seeding are other factors that can influence perennial ryegrass winter survivability.

Research with ryegrass winter kill indicates, if the crown area of perennial ryegrass is healthy, respectable yields can be obtained even with low ryegrass plant counts. For example, U of MN researchers conducted two ryegrass stand assessment trials in 2009 and 2010. Result of this research indicates that low populations, 1 to 2 plants/square foot, produces similar seed yields as 3 to 4 plants/square foot (Table 2 and 3). The results from these two trials suggest ryegrass plant stands of 1 (33% of full stand) and 2.1 plants/square foot (56% of full stand) produced similar yields compared to >4 and 3 in 2010 and 2009, respectively.

Table 2. Perennial ryegrass 'Arctic Green' yields influenced by plant stands at Magnusson Research Farm in 2010.

Ryegrass Plant Stand	Ryegrass Stand	Seed Yield
(plants/square foot)	(%)	(#/acre)
0.5	15	838
1.0	33	1010
2.0	50	1118
>4.0	100	1186
LSD (0.05)		299

Table 3. Perennial ryegrass 'Quest' yields influenced by plant stands near Roseau in 2009.

Ryegrass Plant Stand	Ryegrass Stand	Seed Yield
(plants/square foot)	(%)	(#/acre)
1.2	39	553
2.1	56	1048
3.0	73	1066

How about if the perennial ryegrass crown was injured? Data from 2015 suggests that weak and injured perennial ryegrass produced 24 and 15% of healthy plants (Table 4). The bottom line in this perennial ryegrass stand research:

- If ryegrass crowns are healthy, low plant populations will produce respectable seed yields
- If ryegrass crowns are injured or weak, data would suggest 25% of a normal perennial ryegrass seed yields can be expected.
- With ryegrass winterkill, most likely, some level of ryegrass crown injury has occurred.
- Percentage of dead plants, in the entire field, will provide a baseline estimate of what has already been lost and will give a good approximation of total ryegrass stand reduction.
- Information in Tables 2-4 will provide guidance on areas of field with thin stands.

- Table 4. Perennial ryegrass plant recovery from winter injury in 2015 averaged over varieties 'Arctic Green' and Fiesta IV.

Plant Condition	Ripe seed	Immature Seed	Total Heads	Seed Yield
	(Pounds)	(Pounds)	(#)	(%)
Healthy	77	34	111	100
Injured	18	48	66	24
Weak	13	28	41	15