

**MINNESOTA TURF SEED COUNCIL
NEWSLETTER
April 21, 2020**

INTRODUCTION

Welcome to the second edition of the Northern Minnesota Turf Seed Growers Newsletter for 2020. The primary objective of this newsletter is to report on weather conditions, crop growth & development, pest management and chart the year-to-date perennial ryegrass growing degree days (GDD) compared to the previous six years. The newsletter is scheduled for weekly distribution from the beginning of ryegrass green-up through swathing.

Suggestions on newsletter content should be directed to: Dave Grafstrom
Email: Grafts010@umn.edu
Cell: 320-293-8722

PERENNIAL RYEGRASS GROWING DEGREE DAYS (GDD)

Perennial ryegrass GDD's will be tracked for the 2020 growing season with comparisons to the previous six years. The accumulation of GDD's will begin after the snow has melted from the perennial ryegrass fields and continue through swathing. A base temperature of 32 degrees F will be used for perennial ryegrass (T-Base = 32 F).

- Year to date GDD = 69 (Table 1)
- Last week (April 13-19) accumulated 9 GDD
- Average GDD for third week of April =71
- Accumulated GDD in April 2020 = 39, compared to long term average of 123 GDD
- Projected GDD for the next 10 days = 120 (Table 1)
- Average GDD for end of April = 86
- If the new 10 day forecast holds, more GDD will be accumulated than the entire year-to-date

Table 1. Growing Degree Days (GDD), March - April 2014 to March - April 2020 near Roseau MN.

Year	2020	2019	2018	2017	2016	2015	2014	2019 vs. 2020
March	30	0	0	90	38	119	0	+30
April		211	184	458	263	367	159	
April 1-19	39							
Total	69	211	184	548	301	486	159	
*April 20-29	120							

* Forecasted GDD at Roseau for the next 10 days.

GENERAL CROP CONDITION

April of 2020 has been cold! On average, the first three weeks will accumulate 123 GDD (5.9/day). Thus far in April of 2020, accumulated GDD is 30 (2.1/day). However, the short term forecast suggest a rapid warmup beginning mid-week. The current 10 day forecast indicates an accumulated GDD of 120 (12/day) which is about average for the end of April. Due to below average temperatures, with freezing temperatures at night, ryegrass plants have not been growing and as a result ryegrass stand assessments for winter injury will have to be made after a few days of warm weather.

GENERAL CROP CONDITION - CONTINUED

Last week several perennial ryegrass plants were dug up and placed in pots. At night these plants were brought inside and were placed back outside after temps were above freezing. After a week's growth all plants have greened up with new healthy tillers growing from the crown region. That's good news! What will be the consequence of the recent cold snap on ryegrass survival? A few days of warm temperatures will be required to make an assessment.

Ryegrass plants generally were green after the snow melted, however the recent cold snap has caused a significant amount of leaf tissue browning. This observation has been made in previous years and for the most part, if the crown was healthy, after a few days of warm weather the new growth was normal. Several plants were pulled and root system observed. The roots from the ryegrass crown region generally had a white color which usually is an indication of a healthy crown.

CROP MANAGEMENT

When should spring nitrogen be applied in perennial ryegrass? Ideally after the frost has come out of the ground and the ground is firm enough for the application equipment to travel without rutting the field. In the environmental conditions of northern MN, perennial ryegrass will go through three distinct phases in the uptake and utilization of nitrogen from the soil. The following list the three phases:

- Phase one - Slow nitrogen uptake, up to approximately **700 GDD**
- Phase two - Rapid nitrogen uptake, approximately **700 to 1,300 GDD**
- Phase three - Nitrogen redistribution, approximately **1,300 GDD to physiological maturity**

Previous fertility research indicates if 30-50 units of nitrogen is fall applied, ryegrass yields were not reduced if spring applied nitrogen is the root zone by 700 GDD. With a spring only nitrogen application program, nitrogen should be in the ryegrass rooting by 500 GDD.

Summary of fertility trial data presented in Table 2. All treatments received an 8-40-40 in the fall.

- 100-0-0 gave 90% of mean ryegrass seed yield
- 140-0-0 in a split application strategy of 30-0-0 in the fall and 110-0-0 in the spring gave seed yields of 101% of mean compared to 140-0-0 spring applied gave 94% of mean seed yield
- 140-0-0 in a split application strategy of 30-0-0 in the fall and 110-40-0 in the spring gave seed yield of 107% of mean
- 180-0-0 in a split application strategy of 30-0-0 in the fall followed by 150-0-0 in the spring gave seed yields of 107% of mean
- In this trial, spring applied phosphorus added to 140-0-0 gave seed yields of 107% of mean

Summary of sulfur trial data presented in Table 3.

- A spring application of 136-0-0-30s gave higher ryegrass seed yields than the field rate of 110-0-0 or the equivalent nitrogen urea rate of 136-0-0
- Ryegrass plants were taller, greener and more vigorous from AMS compared to urea alone
- Conclusion, a spring application of sulfur was beneficial for ryegrass growth, development and yield in this location

Additional perennial fertility data is available on the MN Turf Seed Website: mnturfseed.org.

Next week's newsletter will be released on April 28th.

Table 2. Ryegrass seed yield (Arctic Green), plant lodging and harvest date influenced by fertility treatment, small plot replicated trial at U of MN Mag Farm in 2017 and 2018.

Treatment [^]	Fall 10/26/17	Spring 5/12/18	Seed Yield*	Lodging **	Harvest Date ***
			(% of the mean)	(%)	
None	0	0	21	1	7/19
140-0-0	30-0-0	110-0-0	101	5.5	7/24
140-0-0	30-0-0	110-40-0	107	6.0	7/23
140-0-0	0	140-0-0	94	4.3	7/23
100-0-0	30-0-0	70-0-0	90	2.5	7/20
180-0-0	30-0-0	150-0-0	107	7.3	7/24
LSD (0.05)			11	1.1	2

[^] All plots received 8-40-40 on 9/14/17 and Apogee at 8 oz/acre at early heading

*Mean seed yield = 1,631 #/acre. The no nitrogen treatment was not included in mean

** Lodging 1-9 scale where 1 = upright plants and 9 = flat on the ground

*** Calendar date of swathing

Table 3. Perennial ryegrass yield, plant height, relative chlorophyll index (RCI) and vigor ratings in 'Evolution' perennial ryegrass on-farm trial at Rice Farms in 2018.

Treatment [^]	Seed Yield (#/acre)	Plant Height* (inches)	RCI** (Index)	Vigor*** (1-9 scale)
136-0-0-30s	1660	21	639	7.7
136-0-0	1342	19	528	4.3
110-0-0	1325	19	513	4.7
LSD (0.05)	139	2	76	1.5

Farmer cooperators: Brian and Sheldon Rice

[^] 110-0-0 was base rate applied to the entire field. Sulfur was applied as AMS (30 units) and 26-0-0 was applied to account for the nitrogen in AMS. Experimental design with three replications and trial was harvested with a commercial combine.

*Plant height is the average of five observations in each treatment

**RCI is a relative chlorophyll index reading taken on 6/4/18. The higher number more green color

*** Plant vigor taken on 6/4/18. A reading of 1 would be low vigor with light green color and a reading of 9 would be high vigor with plants a deep green color