MINNESOTA TURF SEED GROWERS NEWSLETTER
September 9, 2013

Topics discussed in this newsletter include: General ryegrass crop condition, late summer seeding of ryegrass, rust in ryegrass, fall weed control and fall fertilizer options for ryegrass.

GENERAL RYEGRASS CROP CONDITION

Spring seeded ryegrass, for the most part, looks great and recent rains have been a positive for area perennial ryegrass fields as we move into the fall season. Reports during wheat harvest of several fields having more ryegrass growth than normal. A couple factors are responsible: 1) the 2013 wheat harvest is a month, or more, later than the 2012 harvest and, 2) as the wheat plant dries down ryegrass plants tend to "stretch" for sunlight. Typically, ryegrass growth in the fall tends to be more horizontal (crown and tiller development) than vertical (jointing).

LATE SUMMER RYEGRASS SEEDING

It's not too late to seed ryegrass for 2014, but the seeding window for optimum seed yield is closing fast. Date of ryegrass seeding trials conducted at the U of MN Magnusson Research Farm indicate ryegrass should be seeded by mid-September to minimize the risk of winter injury and still be on the upper end of the yield curve. Complete trial results can be found on the MN Turf Council web site: http://www.mnturfseed.org/html/progress_reports.html

CROP MANAGEMENT

Rust in Ryegrass

Light to moderate levels of rust have been observed on young ryegrass plants. No question rust on ryegrass leaves looks bad. However, previous research indicates leaf and stem rust will not survive northern Minnesota winters. Thus, once ryegrass has overwintered, new rust infections come from spores blown in from the southern Unites States. Fungicides applied in the fall are effective in rust control, but fall applied fungicides didn't show any benefit to the next years ryegrass growth, development and yield compared to ryegrass that didn't receive a fall fungicide treatment. The bottom line; rust on ryegrass in the fall looks bad, but rust controlled in the fall didn't reduce the incidence of leaf and stem rust the following summer.

Fall Broadleaf Weed Control

Winter annual broadleaf weeds can be a problem in ryegrass fields. These winter annuals emerge in late-spring into summer and produce a rosette of leaves in the fall. In early spring, these plants will bolt, flower and produce seed. Shepardspurse, cockle, field pennycress, black seed plantain, catchfly and green flower pepper weed are examples of winter annual weeds. Winter annual plants grow rapidly in the spring, and often times are flowering and/or have produced seed before a scheduled spring broadleaf herbicide treatment. A tank mix of Banvel and 2, 4-D will go a good job of winter annual and other broadleaf weed control. In addition to winter annual weeds, a late summer/early fall herbicide treatment will have good activity on thistles, dandelion, dock, clovers and other broadleaf weeds. Cockle and the winter annuals have a rapid growth habit in the spring and tend to produce seed before many of the other broadleaf weeds are out of the ground. Herbicide applied in late summer/early fall will control weeds in the fall which will allow for a more timely application broadleaf weeds that emerge in the spring. Product use rates of dicamba and 2, 4-D will vary with the weed spectrum, but a tank mix of ¾ pint dicamba and ¾ pint 2, 4-D is a good base-line treatment. Talk to your agricultural supplier for tank mix rates that have been successful based on local experience.

Barnyardgrass and Foxtails

Barnyardgrass, foxtails and wild oat are grassy weed species observed from the combine during wheat harvest. More than likely, if these grasses were seen from the combine during wheat harvest, they will be a problem in next year's ryegrass crop. Make note of these fields and plan to apply Puma or Assure II in Assure tolerant ryegrass. Another option is Nortron which has activity against 'stubborn' wild oat, annual bluegrass, foxtail barley, volunteer cereals and other weeds. Nortron relies on root uptake and needs to be applied pre-emergent or before weeds to be controlled are in the 2-4 leaf stage. Rainfall is required for activity. A 2 pint/acre rate applied late fall (mid-late October) or early spring is required for weed control in ryegrass. Soil carryover of Nortron can be a concern in the unlikely event the ryegrass taken out for some reason in the spring. A Nortron carry over trial was conducted at the Magnusson research farm in 2013 and results will be available at the winter ryegrass meetings.

FALL FERTILIZER

How much fertilizer should be applied to perennial ryegrass in the fall? That's a question ryegrass producers have struggled with for several years. In the last few years, there has been a shift from 100% of the nutrient requirements for ryegrass applied in the fall, to the majority of the nitrogen fertilizer applied in the spring. In the ideal world, the most efficient use of crop nutrients would be to apply the crops nutritional requirements just before the plant needed the nutrient.

What is the nutrient uptake curve look like in perennial ryegrass? Biomass and nitrogen uptake in perennial ryegrass follow an S-shaped (sigmoidal) crop growth curve which can be divided into three distinct phases:

- Slow growth in the vegetative to tillering stages - Phase 1
- Rapid growth during jointing through heading - Phase II
- Slow growth late in the season - Phase III

The nitrogen uptake curve for perennial ryegrass grown in Willamette Valley has been documented by University researchers in the Pacific Northwest. A 1,500 pound ryegrass seed crop will accumulate a maximum dry matter production of 5 tons/A with a maximum accumulation of nitrogen of 120 pounds/A. Source of this information is from an extension bulletin (PNW 513) titled: Nitrogen Uptake and Utilization by Pacific Northwest Crops:

In Minnesota conditions the approximate growing Degree Days (GDD) and nitrogen uptake for Phase I, II and III based on nitrogen research data from the PNW.

- Phase I - 30 # nitrogen; up to 700 GDD: ryegrass growth stage - vegetative to late tillering.
- Phase II - 90 # nitrogen; 700-1,500 GDD: Ryegrass growth stage - jointing to heading.
- Phase II - limited nitrogen uptake, but the nitrogen is redistributed within the ryegrass plant from leaves and stems to the developing seed; 1,500 to 2,800 GDD: ryegrass stage pollen shed to swathing.

The ryegrass plant must have nitrogen available during phase I. This is especially important for good crown and tiller development in the fall. This year's wheat crop, for the most part, is better than expected and with the recent rains; the soil levels of nitrogen are low. A modest amount of fall nitrogen applied with the P and K will promote good crown and tiller development prior to the onset of winter.

Phase II is the time for rapid nitrogen uptake in ryegrass. This corresponds to ryegrass in the jointing to early heading stage. Research from Oregon indicates ryegrass plants can take up 2 to 4 pounds of nitrogen/day during Phase II. This rapid uptake of nitrogen is completed at head emergence which is 6 weeks or more prior to harvest. It is critical to have nitrogen in the root zone during this period of rapid nitrogen uptake.

The above numbers are what the ryegrass plant will need for a 1,500 pound seed crop. How much nitrogen do we need to apply? If we could apply nitrogen with 100% efficiency the numbers above would be close to what should be is applied (minus soil contribution). Unfortunately, we are far from 100% efficient when it comes to nitrogen use efficiency.

It is important to talk to your grass seed fieldman and local agronomists to determine a timeline for plant food applications in ryegrass that fits into your farming operation. Research has indicated the bulk (up to 80%) of the nitrogen must be in the ryegrass root zone prior to the rapid uptake phase II (late tillering to heading). If all nitrogen is to be applied in the spring, fertilizer application should be earlier (250-450 GDD) than if the nitrogen is applied in a split application program (fall and spring) program (up to 800 GDD).

Nitrogen additives and stabilizers:

ESN and Agrotain are two products that can improve nitrogen use efficiency which have been tested by the University of Minnesota. These products work in very different ways and it is important to understand the principles for each product. ESN is a polymer which provides a protective coating to the urea granules and delays the release of nitrogen until the coating breaks down in the soil. Nitrogen release can be unpredictable, so it's generally not recommended for ESN to be the only source of applied nitrogen. A blend of Urea with ESN may have merit, especially with fall applications of nitrogen. Talk with your fertilizer supplier for blends of urea and ESN that have successfully been used in your area.

Agrotain is a nitrogen stabilizer product and is available as, Agrotain Ultra and Agrotain Plus. Both are liquid formulations that can be mixed with dry urea or in liquid formulations. Agrotain products are nitrogen stabilizer and will not interfere with nitrogen release, rather function to reduce the nitrogen loss into the environment. Agrotain Ultra can reduce the volatility of urea after nitrogen application. Agrotain Plus also helps stabilize the nitrogen in the soil but again does not interfere with the availability of nitrogen. A conversation with your fertilizer supplier about Agrotain performance in your area will help determine utility of this product in your ryegrass fertility program.

What about Phosphorus (P) and Potassium (K) in perennial ryegrass seed production? P and K are important nutrients that promote root development and improve the winter survivability. Further, research from Montana indicates phosphorus is responsible for 75% of the adventitious (tiller) root development in winter wheat. In ryegrass seed production, tillering capacity in plants is important to maximize seed yields. Fall applied phosphorus will enhance adventitious root development. Tillering is important for ryegrass seed production and research data has confirmed tillers formation in the fall tend to produce more and heavier seed than tillers formed later in the growth cycle of ryegrass (source: K. R. Brown New Zealand Ag Research 1980). This is not to say spring tillering is not important, but tillers formed in the fall appear to be more productive than tillers formed in the spring. Fall applied P and K applied will help promote fall tillering and help minimize winter kill in ryegrass.

What is the bottom line when it comes to fertilizer application timing in ryegrass? That's an on-going conversation to be had with your seed company fieldman and local agronomists. Fertilizer rates and timings in ryegrass seed production will depend upon time, labor and equipment constraints. Management decisions will have to be made which strive to balance nutrient availability to the ryegrass, available labor and equipment and at the same time strike a balance with environmental stewardship. However, a fertility program with P and K with a small amount of N applied in the fall with the majority the nitrogen spring applied makes the most sense agronomically for ryegrass seed production. In the event of a wet spring, a small amount of fall applied nitrogen will extend the application window for spring applied nitrogen which will make nitrogen timing in the spring less critical.

The following is an example of a best management fertility program in ryegrass based upon the latest research.

- P and K (based on soil test or 30 units of each) and 30 - 40 units of nitrogen applied in the early fall
- Up to 80% of nitrogen (based on yield goal) applied in the spring (early to mid-tillering) 400-600 GDD

Straw management

After wheat harvest, a light harrowing operation will aid in the uniform spread of the wheat straw which helpful to the growth and development of the ryegrass plants. In addition, this harrowing can may help incorporate P and K making it more available to the ryegrass root system.