

LATE FALL FERTILIZATION OF TURF

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Early fall is an important season for turf growth and recovery and nitrogen fertilization is needed to accomplish this. Hopefully you have already applied the early fall nitrogen application. Late fall fertilization is also very important. It helps turf to overwinter, and it encourages root growth and early spring green-up. With the onset of fall temperatures, shoot growth stops, plants continue to photosynthesize, roots will continue to grow and the plant will accumulate carbohydrate reserves. This will allow the plant to store carbohydrates which helps it to survive the winter and promote early green-up in the spring.

It is essential to stress the importance of timing on the application of the late fall nitrogen application since the prime period producing optimal benefits may only last a couple of weeks.

Late fall fertilizing of turf offers many advantages:

- turf which stays green longer in the fall
- increased winter hardiness
- early spring green-up
- no need for early spring fertilizer and the flush of soft spring growth is avoided
- the first spring fertilizer application can be delayed until late May/early June

Principles of Late Season Fertilization

- Nitrogen is taken up by the roots even though shoot growth has ceased. This is because roots remain active at cooler temperatures.
- Nitrogen enhances fall colour and hence increases chlorophyll content.
- Increased chlorophyll content means increased photosynthesis.
- Increased photosynthesis means increased sugars. Since turf is not growing at the time of the fertilizer application, the sugars which are produced are not used for growth but are stored to enhance winter survival and spring recovery.

- Late season nitrogen promotes deep rooting during fall. Plants go into spring and summer with deeper, healthier roots.
- Spring green-up is early because the nitrogen stored in the roots is there ready when shoot growth resumes.

Timing

It is essential to stress the importance of timing on the application of the late fall nitrogen application since the prime period producing optimal benefits may only last a couple of weeks. With improper timing, the fertilizer will be either detrimental or ineffective. An early application (during mid-September to the end of October) will force succulent growth and tissue hydration which increases the turf's

susceptibility to winter disease and low temperature kill. An application of nitrogen fertilizer when turf has already gone dormant will not produce the carbohydrates that promote root growth or allow the plant to produce and store carbohydrates that will result in early spring green-up. The optimal time for the late fall application is when the temperature has steadily lowered to the 10°C level. The shorter days and cool nights allow the plants to begin to accumulate carbohydrates more efficiently. The turf is still green at this point, the shoots are no longer growing, the roots are still growing and it is well before dormancy. Timing of application in the Guelph area is late October to early November. It could be up to a

Table 1. Rating of Nitrogen Sources for Suitability for Late Fall Fertilization.

Nitrogen Source	Analysis	Source of N	Suitability for Late Fall
Quick Release Urea	46-0-0	urea	Excellent
Ammonium nitrate	33-0-0	AN	Excellent
Ammonium sulfate	21-0-0	AS	Excellent
Ammonium phosphate	18-46-0	DAP	Good
Urea Formeldehyde Reaction Products Nutralene	40-0-0	methylene ureas	Good
Methylene urea	39-0-0	methylene ureas	Good
Nitroform (Gran.)	38-0-0	ureaform	Poor
Natural Organics Milorganite	6-2-0	activated sludge	Poor
Sustane	5-2-4	composted turkey litter	Poor-Fair
Ringer products	6-1-3	seed & bone meals, blood	Poor
IBDU	31-0-0	IBDU	Good-Excellent
Coated Materials Sulfur-coated urea	varies	urea	Fair-Good

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week later in the most southwestern part of the province and as much as a week to 10 days earlier in the northern part of the province.

Application Rates

The late fall application can range from 0.5-1.0 kg of N per 100m². The higher rate should be used if turf is very thin. On turf that receives heavy traffic, an application of potash in the late fall will also help the turf with overall stress tolerance. Potash rates should be applied according to soil test results.

Fertilizer Selection (See Table 1)

Water soluble or quick release fertilizer allows the nitrogen to be available to the plant regardless of soil temperature. If choosing a slow release form of nitrogen, no more than 25-30% of the nitrogen should be in a slow release form. Some examples of quick release forms that are suitable are urea, ammonium nitrate, am-

Above: Darker green plots showing early spring green-up are those that received a late fall fertilizer application.

monium sulfate, potassium nitrate and ammoniated phosphates. IBDU is considered a slow release formula of nitrogen, but it is well suited to the late fall application.

Environmental Considerations

Late fall fertilization has many advantages, but there are environmental risks associated with it. Late fall, winter and early spring brings precipitation which recharges the aquifers. Potential leaching of soluble substances such as nitrate is increased during these periods. It is no longer recommended on highly permeable soils, such as sand, to fertilize late in the fall. In these situations, slow release sources such as IBDU and sulfur-coated ureas should be used which help prevent leaching of nitrates. ♦

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