

CHAPTER 4. SELECTING TURF VARIETIES

INTRODUCTION

Selecting the right turfgrass varieties and mixtures is an essential part of establishing a healthy, sustainable lawn. Turf research has produced a wide range of named varieties (cultivars) with improved colour and texture, disease resistance, drought and wear tolerance, and vigorous growth. This makes it possible to choose the cultivars that may be better suited to a particular site.

This chapter contains basic information about lawn species and choosing seed mixtures to suit site conditions.

LAWN SPECIES

Notes on species grown in lawns in this region are included below. Detailed descriptions of species characteristics are not included because these are easy to find in turfgrass references (*see* Further Reading at the end of the chapter). For information on cultivar characteristics, consult seed supplier bulletins. Some features are also rated and published by the National Turf Evaluation Program (NTEP - *see*: <http://www.ntep.org/>).

Common Turfgrasses

The most common turfgrass species used in general purpose lawns in the Atlantic region are Kentucky bluegrasses, creeping and fine fescues.

Kentucky Bluegrasses: The most desirable species for colour, density, and cushiony feel underfoot. They have high nitrogen and water requirements, however, and are quite vulnerable to chinch bug damage. An important advance in Kentucky bluegrass research, which should have a major impact in the next 3-5 years, is the development of cultivars that perform well at low rates of nitrogen (e.g., 0.5 kg/100 m² or 1 lb/1000 ft²).

Fescues: These blend nicely in a turf surface with bluegrasses, are very winter hardy, thrive under lower nitrogen programs than bluegrasses, are more tolerant of drought and poor soil conditions, and seem to be more resistant to chinch bug damage. Fescues tend to be somewhat stiffer in texture and lack the resilience of bluegrasses underfoot, which may make a pure fescue lawn less desirable from the customer's point of view.

Other Turfgrasses

Ryegrasses: Because ryegrass germinates in 3-5 days under good conditions, they are normally incorporated in seed mixtures to provide rapid cover. They act as a nurse crop for the slower germinating permanent turfgrasses. Both annual and perennial ryegrasses are available, but both are essentially annuals in New Brunswick and the zone 4 areas of other provinces. Tests at Truro have

demonstrated that perennial ryegrasses may survive for longer periods, but they cannot be considered a reliable, permanent cover.

Since perennial ryegrasses rarely survive more than two years in local conditions, it is more economical to use the lower cost, annual selections in seed mixtures. A ryegrass content of up to 20% by weight of the total seed mix is adequate for this purpose. Using higher amounts of ryegrass tends to suppress root development of permanent species.

Tall Fescues: These are not generally used in the region as they seem to be less winter hardy. While there are reports of limited success using tall fescues in Nova Scotia, there is little experience with them in New Brunswick.

Bent Grasses: Also not normally used in lawns in this area.

Other Lawn Species

There is a growing awareness of the benefits of biodiversity in lawns. This means allowing or intentionally planting a variety of plants, not just turfgrasses. The benefits include:

- improved drought tolerance, which saves water,
- reduced need for fertilizer and chemical inputs, and
- high tolerance to chinch bug damage.

In 2002, a chinch bug survey conducted in New Brunswick found little visible damage in biodiverse lawns.¹ This was even at population counts of up to 1200 chinch bugs per square foot (0.1 m²). There was obviously damage to the bluegrass, and possibly to the fescue, but the other plants growing in the lawn masked the damage.

White clover: This plant has good potential for use as a complement to turfgrasses. In a recent trip to the UK one of the authors found that most turf – even at Windsor Castle – contained an even distribution of clover. There are several advantages to seeding a mixture containing 5% or more white clover. The clover plants generate a substantial amount of nitrogen naturally (estimates of 50 to 150 kg of N/ha annually have been reported). This is sufficient to feed the turf plants with little or no added nitrogen. The deep-rooted clover also remains green through the summer drought when the turf species turn brown.

CHOOSING SEED MIXTURES

Turf seed is sold in pure form, as blends and as mixtures. A blend is two or more cultivars of a species, such as ‘Baron’ and ‘Midnight’ Kentucky bluegrass. A mixture contains two or more species, such as Kentucky bluegrass, creeping fescue, and ryegrass.

Qualities to consider when deciding on a seed mixture for a new lawn include:

- quick establishment into a uniform turf with high customer appeal (conventional seed mixtures meet these requirements in most situations),

- low maintenance characteristics, such as drought tolerance or a low requirement for nitrogen, that help reduce environmental impacts,
- tolerance or resistance to pests, such as to chinch bugs or turf diseases.

Starting with a mixture of bluegrasses and fescues ensures there is enough variety in the mix to provide a turf that will adapt to the site and the maintenance conditions over time. For high quality turf, starting with blends of two or more of the superior cultivars of each of the permanent turf species can ensure the best performance.

Shade Tolerant Turf

Turfgrasses need plenty of light to thrive. While some mixtures are promoted as shade mixes, they do not add a significant level of shade tolerance. Re-seeding sparse areas in shady areas generally does not succeed in the long term. This is because the shade is often from trees in the landscape; as they grow to maturity, the expanding canopies will further reduce light levels. A more effective solution is to replace the turf in such locations with a bed of shade-tolerant perennials.

Seed Containing Endophytes

Some fescue and ryegrass seed selections have been identified that contain endophytes.* These are fungi that live inside the grass plant, benefiting the host plants by providing protection from insects that attack the shoots. (For an interesting discussion of endophytes, see the University of Rhode Island site <http://www.uri.edu/ce/factsheets/sheets/endophyte.html>.) So far, no bluegrasses have been found with this characteristic.

Cultivars containing endophytes cost more, but the extra cost may not be justified at this time, because:

- no research exists under our conditions to show the effectiveness of endophytes against chinch bugs,
- endophytes in seed can die under poor handling and storage conditions and there is no practical field test to determine whether they are still alive at planting time, and
- only fescue cultivars (in the permanent species for our region) contain endophytes. In a severe infestation chinch bugs will likely decimate the bluegrasses anyway, leaving a patchy appearance.

Seed Counts in Mixtures

The actual seed count in a mixture is quite different from the ratio shown on the label because of the differences in both size and weight of seeds of different species. For example, compare two mixtures:

* A list of perennial ryegrass and fine fescue varieties and their endophyte content can be found in: 'Turfgrass Insects' from Colorado State Univ. Co-op. Extension: <http://www.colostate.edu/Depts/IPM/natparks/turfpest.html> See Table 1. Endophyte Levels for Perennial Ryegrass, and Table 2. Endophyte Levels for Fine Fescues.

- a commonly available mixture for general purpose turf with a ratio of 40% Kentucky bluegrass: 40% fescue: 20% ryegrass, by weight. This contains over 75% Kentucky bluegrass by seed count because the seed is smaller than the other species (*see* Table 4-1).
- a popular mix for shade, with a higher fescue content, has a ratio of 30% bluegrass: 60% fescue:10% ryegrass, by weight. While it would seem otherwise, this mix is nearly two-thirds bluegrass.

Both mixtures provide 30,000 - 55,000 seeds per m² at the recommended seeding rates of 1.5 to 2.5 kg/100 m² (3-5 lb/1000 ft²):

Type	Number of seeds in 1 lb. (0.45 kg)					Approximate germination time
		40-40-20 mixture	% of type in mixture	30-60-10 mixture	% of type in mixture	
Bluegrass	2,200,000	880,000	76	660,000	63	1 - 2 weeks
Fescue	600,000	240,000	21	360,000	35	5 - 7 days
Ryegrass	200,000	40,000	3	20,000	2	3 days
Totals		1,160,000		1,040,000		

Table 4-1. Seed counts and germination times for Kentucky bluegrass, fescue and ryegrass. (From Beard²).

FACTORS AFFECTING TURF COMPOSITION

Despite efforts to choose the best blends and mixtures for the lawns, the desired results may not materialize. Three general factors that may affect what ultimately grows in the lawn are discussed below. These are:

- Turf variety test results do not necessarily apply to Atlantic conditions.
- The Canada Seeds Act offers little assurance of quality.
- What you plant isn't necessarily what you get in the established lawn.

Turf Variety Test Results Do Not Necessarily Apply to Atlantic Conditions

Most research and testing is done under warmer conditions than those in the Atlantic region, therefore performance may be different here. For example, in one trial conducted in New Brunswick in the mid-1970's with 10 of the top NTEP rated Kentucky bluegrass cultivars, half of those tested performed more poorly than the control seed plots.³ This was primarily due to lack of winter hardiness – a factor that is not rated in most testing programs, but is quite significant over most of the region.

Disease resistance ratings are generally not important under New Brunswick conditions, because the climate appears to suppress turfgrass diseases in general use turf. Disease ratings may be important in other centers in the region, however, where some disease problems have been reported.

The Canada Seeds Act Offers Little Assurance of Quality

Under the Canada Seeds Act, grading standards for Canada No. 1 Lawn Grass Mixtures (which applies to most seed mixtures supplied to the trade) call for:

- a minimum of 70% germination for each seed component,
- 85% pure seed by weight,
- a maximum of 5% by weight white clover, brown grass, orchard grass or tall fescue, and
- a maximum of 2.5% by weight of weeds and other plants.⁴

This specification allows a great deal of latitude for troublesome weeds and objectionable turf varieties, such as annual and rough-stalked bluegrass. At normal seeding rates, the allowable limit of 7.5% by weight would allow up to 100 undesirable seeds per square metre. This sounds like a lot, but in most situations the seed bank already in the topsoil is more of a problem than contaminants in the seed mixture.

In special cases, however, the permitted contaminants can be a serious problem. For example, in one case of seed purchased for a field of sod, the rough-stalked bluegrass component was tested at 0.1%, which is about one-twentieth of the allowable limit. This resulted in about 20 rough-stalked bluegrass seeds per square metre and nearly forced the sod producer out of business. In such critical situations, the purchaser should seek assurance, in writing, from the seed supplier that the product is free from specific objectionable contaminants.

No Canadian turf seed mixtures can be labeled with a grade higher than Canada No. 1. Specifications are often written that call for Certified mixtures; these specifications are incorrect because the more stringent “Certified” ratings are discarded when containers of Certified seed are opened for mixing.

What You Plant Isn’t Necessarily What You Get

The results of seeding or sodding may be determined more by site soil conditions and follow-up maintenance than by the original blend and quality of the seed mixture.

Three important factors determine the result of seeding:

- the original seed mixture (discussed above),
- the survival of the seeds planted, and
- the adaptation of cultivars to the site conditions.

The final composition of the lawn is determined by how well the plants survive after seeding, and how they adapt to the site. This depends on the timing of the seeding and the effect of moisture and growing conditions on the establishment of the turf (*see* Chapter 5). The long-term adaptation to the site depends on the soil conditions and on the management practices.

The impact of soil quality on establishment



The site in this photo was prepared in late August. One operator prepared and seeded the area to the left (between the curb and the property line) using high quality manufactured topsoil. A second contractor prepared the area to the right, using a poor quality soil. Both areas were hydraulically seeded at about the same time; seed mixtures, fertilizers and follow-up care were essentially the same. This picture, taken the following spring, shows the positive impact of the high quality soil. The area on the left had established satisfactorily, while the area to the right, as well as the remainder of the property, had to be reseeded.

THE CASE FOR SUSTAINABLE LAWNS

Choosing the right seed mixtures for the site and the intended management regime reduces the need for water, fertilizer and herbicides. For example, under good soil conditions, with adequate moisture, a mix of bluegrass and fescue provides a healthy dense stand of turf. This resists weed invasion and has some resistance to chinch bug damage. Under poor soil conditions, however, bluegrass-fescue mixtures require considerable fertilizer and water to remain attractive and are more vulnerable to insect damage.

A better choice for poor conditions would be a pure fescue turf. It requires fewer inputs and (with selected varieties) may be chinch bug resistant, although it does not have the same appealing appearance of a pure Kentucky bluegrass or bluegrass-fescue mixtures.

Growing a biodiverse lawn, with white clover or other plants, is a radical departure from the traditional idea of weed-free turfgrass lawns. However, it has several advantages, including substantial resistance to chinch bug, tolerance to drought and reduced fertilizer needs. Clover in a turf can produce enough nitrogen to feed the turf plants.

KEY POINTS

- The major factors affecting the quality of the lawn are soil conditions, and growing conditions after seeding.
- General-purpose bluegrass-fescue-ryegrass mixtures work well in most situations.
- Premium seed mixtures require a high-quality soil foundation to realize their potential.
- Where seed quality is critical, obtain written assurance from the supplier that contaminants are not present.
- Consider incorporating white clover in the seed mixture or sod to take advantage of the natural nitrogen source and chinch bug resistance.

REFERENCES

- ¹ Wellwood, A., G. Nickerson and J. Wetmore. *Hairy Chinch Bug Survey, Demonstration and Monitoring in New Brunswick, 2002*. New Brunswick Department of Agriculture, Fisheries and Aquaculture and New Brunswick Horticultural Trades Association, Fredericton NB. On-line at: http://nbhta.ca/Chinch_Bug_Report.pdf
- ² Beard, J. B. *Turfgrass Science and Culture*. 1973. Prentice-Hall, Englewood Cliffs, NJ. (Table 16-2) p. 511.
- ³ Unpublished results from Turf Evaluation Trials conducted by the New Brunswick Department of Agriculture and Wetmore's Landscaping at Fredericton, NB. 1974–1977.
- ⁴ *Canada Seed Regulation Schedule 1*. See Table XIV, Part 1. <http://laws.justice.gc.ca/en/S-8/C.R.C.-c.1400/165942.html>

FURTHER READING

Eggens, J. L. *Turf Management – Principles and Practices*. Study Guide. Eleventh Edition, 1998. Department of Horticulture, University of Guelph. Guelph ON. Chapter 2: Turfgrasses, Strengths, Weaknesses and Uses.

Sheard, R. W. *Understanding Turf Management*. 2000. Sports Turf Association of Ontario, Guelph ON.