### Turfgrass Characteristics

<table>
<thead>
<tr>
<th>Species</th>
<th>Growth Habit</th>
<th>Establishment Rate</th>
<th>Mowing Height</th>
<th>Shade Tolerance</th>
<th>Drought Tolerance</th>
<th>Cold Tolerance</th>
<th>Turf Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perennial Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>1.5-2.5”</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>2.0”</td>
<td>fair to good</td>
<td>fair</td>
<td>good</td>
<td>very good</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>bunch type/Spr.</td>
<td>slow</td>
<td>1.5-2.5”</td>
<td>fair to good</td>
<td>fair</td>
<td>very good</td>
<td>very good</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td>spready, Rhizome</td>
<td>medium</td>
<td>1.5-3.0”</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
</tr>
<tr>
<td>Fine Fescues</td>
<td>bunch type or Spread by tillers</td>
<td>medium</td>
<td>1.0-2.5”</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
<td>poor to fair</td>
</tr>
<tr>
<td>Creeping Bentgrass</td>
<td>spread by stolons, Rhizome</td>
<td>medium</td>
<td>0.125-1.0”</td>
<td>very good</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
</tbody>
</table>

### Adaptation of Cool Season Species by Region

- **Cool humid PNW**
  - Perennial ryegrass
  - Kentucky bluegrass
  - Fine fescue
  - Tall Fescue
  - Bentgrass

- **Cool Semiarid**
  - Tall Fescue
  - Kentucky bluegrass
  - Perennial ryegrass
  - Fine fescue
  - Bentgrass

- **Cool humid northeast**
  - Kentucky bluegrass
  - Perennial ryegrass
  - Tall Fescue
  - Fine fescue
  - Creeping bentgrass
  - Annual Ryegrass

- **Warm arid & Semiarid**
  - Perennial ryegrass
  - Tall Fescue

- **Warm humid**
  - Tall Fescue
  - Perennial ryegrass
  - Creeping bentgrass

### Alliance for Low Input Sustainable Turf

Alliance for Low Input Sustainable Turf (A-LIST) is a non-profit industry initiative with a mission to foster development of turfgrass varieties that perform under reduced inputs and levels of management, leading to a more sustainable environment. Lebanon Turf is a founding member of A-List. A-LIST has established a voluntary evaluation program including metrics like water conservation, reduced fertility, traffic, heat, and drought stress tolerances, all with no fungicide or insecticide applications. Results in NTEP trials are also considered. Products that meet the acceptance criteria can utilize the A-LIST Approved symbol in their marketing. Trials are under way to evaluate Kentucky bluegrass, Tall fescue, perennial ryegrass, and Fine fescue varieties.

These Lebanon Turf turfgrass varieties have been approved by A-List. They are found in our A-List approved blends and mixes which require a minimum of 85% A-List varieties to carry the A-List approved tag. Using A-List approved varieties assures you of a more sustainable turfgrass lawn, sports field, or golf course for the future!
Perennial Ryegrass has non-spreading, bunch type growth habit. It germinates and establishes quickly, has a dark green color, medium fine texture, and good winter characteristics. Perennial ryegrass requires full sun, or full shade, with other species. The best selection of perennial ryegrass varieties that enhance your overall lawn requires a mix that is composed of Kentucky bluegrass and perennial ryegrass. Kentucky Bluegrass has dark green color, medium fine texture, and good winter characteristics. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high traffic high quality turf Kentucky bluegrass should receive medium to high maintenance. Tall fescues have upright growth habit that persists in the warmer areas of the cool season range of adaptation. It has a deep root system, which helps it to be more heat and drought tolerant. Plant breeders have made great improvements in the species over the last decade. The newer varieties of dark green and almost as fine textured as the improved Kentucky bluegrasses. A mowing height of 1.5 – 3 inches is recommended. Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high traffic high quality turf Kentucky bluegrass should receive medium to high maintenance.

Perennial ryegrass has non-spreading, bunch type growth habit. It germinates and establishes Quickly, has a dark green color, medium fine texture, and good winter characteristics. Perennial ryegrass requires full sun or full shade with other species. The best selection of perennial ryegrass varieties that enhance your overall lawn quality requires a mix that is composed of Kentucky bluegrass and perennial ryegrass. Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high traffic high quality turf Kentucky bluegrass should receive medium to high maintenance.

Perennial ryegrass has non-spreading, bunch type growth habit. It germinates and establishes quickly, has a dark green color, medium fine texture, and good winter characteristics. Perennial ryegrass requires full sun or full shade with other species. The best selection of perennial ryegrass varieties that enhance your overall lawn quality requires a mix that is composed of Kentucky bluegrass and perennial ryegrass. Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high traffic high quality turf Kentucky bluegrass should receive medium to high maintenance.
Tall Fescues

- A-List Approved!
- Pythium resistance
- Medium-fine leaf texture
- Excellent mowing quality
- Excellent Brown Patch resistance
- Very dark green genetic color

Tall fescue is a bunch type grass that persists in the warmer areas of the cool season range of adaptation. It has a deep root system, which helps it be more heat and drought-tolerant. Plant breeders have made great improvements in this species over the last decade. The newer varieties have dark green and almost as fine-textured as the improved Kentucky bluegrasses. A growing height of 1.5-3 inches is recommended.

Perennial Ryegrass

- A-List Approved!
- Available fall 2018
- Good leaf spot resistance
- Very good drought tolerance
- Excellent leaf color

Perennial ryegrass has non-spreading, bunch type growth habit. It is gamekeeper and establishes quickly, has a dark green color, medium fine texture, and great wear characteristics. Perennial ryegrass is a valuable in the fall or in mixes with other species. The best when selecting perennial ryegrass varieties that enhance your turf’s look on your list of considerations. Endophyte aid against turf disease and ensure a good stand of turf.

Kentucky Bluegrass

- A-List Approved!
- Available fall 2018
- Dark green color blends with other species
- Excellent leaf spot resistance
- Rhizomatous spreading habit
- Excellent establishment
- Excellent performance with lower inputs
- Superior overall turfgrass quality
- Excellent overall turf quality
- Excellent Gray Leaf Spot resistance
- **New!**

Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high quality turf, Kentucky bluegrasses should receive medium to high maintenance.
Perennial Ryegrass

Perennial ryegrass has non-spreading, bunch type growth habit. It germinates and establishes quickly, has a dark green color, medium fine texture, and good wear characteristics. Perennial ryegrass is valuable for dormant or mixtures, with other species. The site selects perennial ryegrass varieties that enhance the overall look of your lawn. Endophytes aid against insects and disease and ensure longevity of your investment. Endophytes aid against insects and disease and ensure longevity of your investment.

- **Top ranked for Grey Leaf spot resistance**
- **Highly rated under medium maintenance**
- **Excellent drought tolerance**
- **Broad disease resistance**
- **Dark green genetic color**
- **Available for 2018**
- **A-List Approved!**

Fine Fescue

- **Top ranked for dollar spot resistance**
- **Excellent disease resistance**
- **High cold tolerance**
- **Excellent green-up and traffic tolerance**
- **Top ranked for Gray Leaf spot resistance**
- **Exhibits Rhizomotous traits**
- **Excellent disease resistance**
- **Excellent performance under lower inputs**
- **A-List Approved!**

Kentucky Bluegrass

Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high quality turf, Kentucky bluegras would receive medium to high maintenance.

- **Heat and drought tolerant**
- **Mid-Atlantic type**
- **High cold tolerance**
- **Excellent turf quality**
- **Excellent disease resistance**
- **Good leaf texture**
- **Excellent overall disease resistance**
- **Tall fescues**
- **A-List Approved!**

Tall Fescues

Tall fescue is a bunch-type grass that persists in the warmest areas of the cold season type of adaptation. It has a deep root system, which helps it to have more heat and drought tolerance. Plant breeders have made great improvements in the species over the last decade. The newer varieties are dark green and almost as fine textured as the improved Kentucky bluegrasses. A amazing height of 1.5–3 inches is recommended.

- **Very dark green genetic color**
- **Excellent Brown Patch resistance**
- **Excellent mowing quality**
- **Medium fine leaf texture**
- **Pythium resistance**
- **Available for 2018**
- **A-List Approved!**

Creeping and Velvet Bentgrass

The latest generation of Bentgrasses are here! With improved turf quality, disease resistance and versatility, these varieties are an excellent choice for new construction or an intensification program for your golf course.

- **Top ranked for overall turf quality**
- **Excellent overall in southwest region**
- **Superior texture and fine leaf quality**
- **Dark green genetic color**
- **A-List Approved!**

New! New! New!

- **Good spring green-up**
- **Improved summer performance**
- **Excellent under traffic stress**
- **Excellent leaf spot resistance**
- **Quick establishment**
- **Excellent drought and heat tolerance**
- **Both cold and hot season resistance**
- **Dark green genetic color**
- **Available fall 2018**
- **A-List Approved!**

Conductor

- **Top ranked for dollar spot resistance**
- **Excellent disease resistance**
- **High cold tolerance**
- **Excellent green-up and traffic tolerance**
- **Top ranked for Gray Leaf spot resistance**
- **Exhibits Rhizomotous traits**
- **Excellent disease resistance**
- **Excellent performance under lower inputs**
- **A-List Approved!**

New! New! New!

- **Top ranked for dollar spot resistance**
- **Excellent disease resistance**
- **High cold tolerance**
- **Excellent green-up and traffic tolerance**
- **Top ranked for Gray Leaf spot resistance**
- **Exhibits Rhizomotous traits**
- **Excellent disease resistance**
- **Excellent performance under lower inputs**
- **A-List Approved!**

Kentucky Bluegrass

Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high quality turf, Kentucky Bluegrass would receive medium to high maintenance.

- **Heat and drought tolerant**
- **Mid-Atlantic type**
- **High cold tolerance**
- **Excellent turf quality**
- **Excellent disease resistance**
- **Good leaf texture**
- **Excellent overall disease resistance**
- **Tall fescues**
- **A-List Approved!**

Conductor

- **Top ranked for dollar spot resistance**
- **Excellent disease resistance**
- **High cold tolerance**
- **Excellent green-up and traffic tolerance**
- **Top ranked for Gray Leaf spot resistance**
- **Exhibits Rhizomotous traits**
- **Excellent disease resistance**
- **Excellent performance under lower inputs**
- **A-List Approved!**

New! New! New!

- **Top ranked for dollar spot resistance**
- **Excellent disease resistance**
- **High cold tolerance**
- **Excellent green-up and traffic tolerance**
- **Top ranked for Gray Leaf spot resistance**
- **Exhibits Rhizomotous traits**
- **Excellent disease resistance**
- **Excellent performance under lower inputs**
- **A-List Approved!**

Kentucky Bluegrass

Kentucky Bluegrass is a widely adapted species that is used for many situations. It exhibits dark green color and medium fine texture. Kentucky bluegrass is able to spread and recover because it grows by underground primary lateral stems called rhizomes. These rhizomes grow out from the main plant and form a new plant, allowing it to form a dense cover. Kentucky bluegrass is a good choice for athletic fields, home lawns, and golf courses. For high quality turf, Kentucky Bluegrass would receive medium to high maintenance.

- **Heat and drought tolerant**
- **Mid-Atlantic type**
- **High cold tolerance**
- **Excellent turf quality**
- **Excellent disease resistance**
- **Good leaf texture**
- **Excellent overall disease resistance**
- **Tall fescues**
- **A-List Approved!**


### Establishment Mowing Shade Drought Cold Traffic Tolerance

<table>
<thead>
<tr>
<th>Species</th>
<th>Growth Habit</th>
<th>Establishment Rate</th>
<th>Mowing Height</th>
<th>Shade</th>
<th>Drought</th>
<th>Cold</th>
<th>Traffic</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perennial Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>1.5-2.5&quot;</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>2.0-2.5&quot;</td>
<td>fair  to good</td>
<td>fair</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>bunch type/Synthetic</td>
<td>medium</td>
<td>1.5-3.0&quot;</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td>spread by Rhizomes</td>
<td>slow</td>
<td>1.5-2.5&quot;</td>
<td>fair to very good</td>
<td>very good</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
<tr>
<td>Fine Fescues</td>
<td>bunch type or Spread by tillers</td>
<td>medium</td>
<td>1.0-2.5&quot;</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
<td>poor to fair</td>
<td></td>
</tr>
<tr>
<td>Bentgrass</td>
<td>spread by stolons, Rhizomes</td>
<td>medium</td>
<td>0.125-1.0&quot;</td>
<td>fair</td>
<td>fair to poor</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
</tbody>
</table>

#### Adaptation of Cool Season Species by Region

- **Cool humid PNW:** Perennial ryegrass, Kentucky bluegrass, Tall fescue, Fine fescue, Bentgrass
- **Cool Semiarid:** Tall fescue, Kentucky bluegrass, Perennial ryegrass, Fine fescue, Bentgrass
- **Cool humid northeast:** Kentucky bluegrass, Perennial ryegrass, Tall fescue, Fine fescue, Creeping bentgrass, Annual Ryegrass
- **Warm arid & Semiarid:** Perennial ryegrass, Tall fescue
- **Warm humid:** Tall fescue, Perennial ryegrass, Creeping bentgrass

---

**PennMulch Seed Accelerator** is a pelleted seed establishment mulch comprised of recycled paper, starter fertilizer, and features Moisture Cell Technology® - a patented super absorbent polymer. PennMulch is designed to reduce weed breakthrough during seed establishment, improve germination by eliminating dry spots, and improve root development, critical to the turf establishment process.

**The original is all you need**

PennMulch Seed Accelerator is the only seed establishment product containing patented Moisture Cell Technology. Comprised of super-absorbent polymers, Moisture Cell Technology can absorb up to 400 percent its weight in water, which causes the pellets to expand and absorb water. As the seed bed dries, the microscopic polymer crystals release water back into the soil, providing the new seedlings with the moisture they need to grow healthy and strong. Though there are look-alike products on the market, university testing shows that none can match the results of PennMulch Seed Accelerator.

**Eliminate weed problems**

Straw and hay often contain perennial grass weeds like Orchard grass and Timothy that cannot be selectively controlled once new turf is established. PennMulch Seed Accelerator contains no weed seeds. Don't waste your time, labor, and premium seed only to have it ruined by weeds.

**Improved efficiency**

Unlike straw or hay, PennMulch never needs to be raked and removed and will not blow into the neighbor’s yard or swimming pool.

**Cost effective**

It’s estimated that up to 30% of the cost of seeding jobs is associated with returning time and again to fix areas that don’t fill-in properly. PennMulch Seed Accelerator can’t guarantee that your customers will water, but it is proven to speed up seedling establishment. PennMulch greatly reduces the chance of seedling failures.
## Turfgrass Characteristics

<table>
<thead>
<tr>
<th>Species</th>
<th>Growth Habit</th>
<th>Establishment Rate</th>
<th>Mowing Height</th>
<th>Disease Resistance</th>
<th>Drought Resistance</th>
<th>Cold Tolerance</th>
<th>Turf Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perennial Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>1.5-2.5”</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>bunch type</td>
<td>very fast</td>
<td>2.0-3.0”</td>
<td>fair to good</td>
<td>fair</td>
<td>fair</td>
<td>very good</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>bunch type/Skip-tooth</td>
<td>medium</td>
<td>1.5-2.5”</td>
<td>very good</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
<tr>
<td>Kentucky Bluegrass</td>
<td>spread by rhizomes</td>
<td>slow</td>
<td>1.5-3.0”</td>
<td>fair to good</td>
<td>fair</td>
<td>very good</td>
<td>very good</td>
</tr>
<tr>
<td>Fine Fescue</td>
<td>bunch type or spread by tillers</td>
<td>medium</td>
<td>1.0-2.5”</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
<td>poor to fair</td>
</tr>
<tr>
<td>Bentgrass</td>
<td>spread by stolons, rhizomes</td>
<td>medium</td>
<td>0.125-1.0”</td>
<td>fair to poor</td>
<td>very good</td>
<td>good</td>
<td>very good</td>
</tr>
</tbody>
</table>

### Adaptation of Cool Season Species by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool humid PNW</td>
<td>Perennial ryegrass, Kentucky bluegrass, Fine fescue, Tall fescue, Creeping bentgrass, Annual Ryegrass</td>
</tr>
<tr>
<td>Cool Semiarid</td>
<td>Tall Fescue, Kentucky bluegrass, Perennial ryegrass, Fine fescue, Bentgrass</td>
</tr>
<tr>
<td>Cool humid northeast</td>
<td>Kentucky bluegrass, Perennial ryegrass, Tall fescue, Creeping bentgrass, Annual Ryegrass</td>
</tr>
<tr>
<td>Warm arid &amp; Semiarid</td>
<td>Perennial ryegrass, Tall Fescue</td>
</tr>
<tr>
<td>Warm humid</td>
<td>Tall Fescue, Perennial ryegrass, Creeping bentgrass</td>
</tr>
</tbody>
</table>

---

**PennMulch Seed Accelerator** is a patented seed establishment mulch comprised of tabled paper, starter fertilizer, and moisture cell technology—a patented super absorbent polymer. PennMulch is designed to reduce weed breakdown during seed establishment, improve germination by eliminating dry spots, and improve root development, critical to the turf establishment process.

---

**Eliminate weed problems**

Straw and hay often contain perennial grass weeds like Orchard grass and Timothy that cannot be selectively controlled once new turf is established. PennMulch Seed Accelerator contains no weed seeds. Don’t waste your time, labor, and premium seed only to have it ruined by weeds.

---

**Improved efficiency**

Unlike straw or hay, PennMulch never needs to be raked and removed and will not blow into the neighbor’s yard or swimming pool.

---

**Cost effective**

It’s estimated that up to 30% of the cost of seeding jobs is associated with returning time and again to fix areas that don’t fill-in properly. PennMulch Seed Accelerator can’t guarantee that your customers will water, but it is proven to speed up seedling establishment. PennMulch greatly reduces the chance of seedling failures.