**General Species Information**

**Affalts** *(Medicago sativa)*
Description - Considered to be the world’s most valuable legume, alfalfa is commonly used for beef and dairy. Its high digestibility and feed value and ability to be stored made it ideal for hay and silage. Alfalfa is also able to be used in a managed grazing system.
Strengths - High yields; good seedling vigor; deep roots; good summer growth; excellent drought tolerance; good persistence under mechanical harvesting; excellent forage quality and palatability.
Limitations - Requires deep, well-drained soils; high pH and high fertility; prone to alfalfa weevil and potato leafhopper damage; can cause clostridium when grazed.

**Red Clover** *(Trifolium pratense)*
Description - This quick-establishing legume can provide high quality and forage quantity for two to three years. Red clover’s tolerance to diverse soils allows it to be used in some areas where alfalfa will not grow.
Strengths - High yields; excellent seedling vigor; tolerates wet and acid soils better than alfalfa; fair summer regrowth; resistant to insects; excellent for renovation and overseeding.
Limitations - Susceptible to crown and root diseases; not heat or drought tolerant; fair palatability; difficult to dry for hay; can cause clostridium when grazed; many varieties only persist 2-3 years.

**Dutch White Clover** *(Trifolium repens)*
Description - Due to its heat and drought resistance, white clover is very palatable. It persists well in pastures that are consistently grazed short and is adapted to a wide range of soil types.
Strengths - Low yields; Tolerates poorly drained soil; very palatable; tolerates close and continuous grazing.
Limitations - Its shallow root system limits production on excessively drained soils and during drought periods; can cause clostridium when grazed.

**White Clover, Ladino** *(Ladino Tifolium repens)*
Description - Ladino white clover varieties are usually more productive than Dutch white clover varieties and will survive taller pasture situations.
Strengths - Tolerates poorly drained soil; very palatable; excellent adaptation to manage- ment grazing systems.
Limitations - Its shallow root system limits production on excessively drained soils and during drought periods; can cause clostridium when grazed.

**Birdsfoot Trefoil** *(Lotus corniculatus)*
Description - Birdsfoot trefoil is a long-lived, non-blooming perennial legume that can provide excellent nutritional value to pasture and additional summer production when grasses often go into a growth slump. It is tolerance to poorly-drained and somewhat acid soils.
Strengths - Medium yields; tolerates poor drainage and acidic soils better than alfalfa; fair summer regrowth; tolerant drought; excellent forage quality, non-blooming.
Limitations - Slower to establish, less productive on alfalfa well-drained, fertile soils; subject to invasion by weeds; slow recovery after hay harvesting; fair palatability; resistant to close cutting; susceptible to root and crown rot; must allow self reseeding for improved persistence.

**Annual Ryegrass** *(Lolium multiflorum)*
Description - Annual ryegrass will last between 1 to 2 years, depending on climate and variety, providing very high yields and high quality forage. Varieties may be either diploid or tetraploid and are usually higher in sugar content, whereas diploid varieties tend to be more tolerant of traffic and continuous grazing.
Strengths - Very high yields; excellent seedling vigor; better adapted for mixtures with legumes; high dry matter yield; fair drought tolerance; fair flooding tolerance in summer; responsive to nitrogen.
Limitations - Difficult to drill unless mixed with something like oats; susceptible to late seasondamage when cut or grazed in jointing stage; more tolerant of frequent cutting; poor summer regrowth; susceptible to sod diseases.

**Orchardgrass** *(Dactylis glomerata)*
Description - This cool-season perennial grass is a versatile perennial tall-growing bunch grass that establishes rapidly and is suitable for hay, slage, or pasture. With its high and dry matter yield, orchardgrass (especially tall fescue) is very competitive to legumes and other grasses.
Strengths - High yield; excellent under good fertility management; shade tolerant; well adapted for mixtures with legumes; rapid regrowth; good summer growth; good drought tolerance; fair flooding tolerance in summer; responsive to nitrogen.
Limitations - Early to mature; forage quality and palatability decline rapidly with head- ing, poor flooding tolerance in winter; aggressive toward legumes; bunchy growth; loss tolerance to drought or winter hardiness as tall fescue and bromegrass; poor winter flooding tolerance.

**Tall Fescue** *(Festuca arundinacea)*
Description - Tall fescue is known to be the most heat tolerant cool-season forage spe- cies. Due to its deep roots, it can tolerate dry and non-condition better than most for- ages. Tall fescue has wide adaptation to different soil types and fertility and allows it to be used in many management practices including hay, stage, managed grazing, and continuous grazing.
Strengths - High yields; persistent; leafy regrowth; good seedling vigor; summer flood tolerance; excellent for barley stockpiling tolerates heavy traffic; easily adapted and persists on acidic soils; soil origin; drought resistant; survives under low-fertility conditions.
Limitations - Poor palatability and quality in summer; low summer production; can become coarse; dominates non-vigorous legumes. Use of endophytes of varieties can cause animal health problems.

**Timothy** *(Phleum pratense)*
Description - A favorite grass for horses and hay, timothy is a cold-hardy perennial bunch grass that can be very productive on grassland on clay, silt, and sandy soils, provided that there is adequate moisture available. It produces most of its annual yield in the first crop.
Strengths - Medium spring yields; late maturity; winter hardy; easy to establish; leafy regrowth; good companion for non-vigorous legumes; popular for horses.
Limitations - Poor palatability and forage quality in summer; not tolerant of frequent cutting; slow recovery; susceptible to damage when cut in the jointing stage; shallow root system - unstable for dry soils; intolerance of hot and dry conditions.

**Smooth Brome** *(Bromus inermis Leyss.)*
Description - Smooth bromegrass is a leafy, soil-forming perennial grass best suited for hay, slage, and early spring pastures, especially on well-drained soils. It spreads by underground rhizomes and through seed dispersal.
Strengths - High yield year; winter hardy; sod-forming; leafy summer regrowth; good drought survival; cool on fertile, well-drained soils.
Limitations - Difficult to drill unless mixed with something like oats; susceptible to late season damage when cut or grazed in growing stage, not tolerant of frequent cutting; poor summer regrowth; susceptible to sod diseases.

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<table>
<thead>
<tr>
<th>Legumes</th>
<th>Longevity</th>
<th>Growth Habit</th>
<th>Primary Seasons of Growth</th>
<th>Plant Height in cm</th>
<th>Seeds per lb</th>
<th>Seedling Vigor</th>
<th>Heat/ Vigor</th>
<th>Cold</th>
<th>Wet Soil Poor Drainage</th>
<th>Salinity</th>
<th>High pH Alkalinity</th>
<th>Low pH Acidity</th>
<th>Optimum pH</th>
<th>Required Fertility Levels</th>
<th>Food Value/ Quality</th>
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<th>Tonnage (Yield)</th>
<th>Continuous Grazing</th>
<th>Rotational Grazing</th>
<th>Hay</th>
<th>Pure Stand</th>
<th>Hay mix with legumes</th>
<th>Hay mix with grasses</th>
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<tr>
<td>Alfalfa Medicago sativa</td>
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<td>Bunch</td>
<td>Spring, Summer, early Fall</td>
<td>40 to 90</td>
<td>200,000</td>
<td>G-E</td>
<td>E</td>
<td>G-E</td>
<td>P</td>
<td>F</td>
<td>F</td>
<td>P</td>
<td>6.6-7.2</td>
<td>M-H</td>
<td>VH</td>
<td>E</td>
<td>E</td>
<td>VH</td>
<td>H</td>
<td>70-300</td>
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<td>P-G</td>
<td>G-E</td>
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<td>F-G</td>
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<td>M-H</td>
<td>P-G</td>
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<td>275,000</td>
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<td>VH</td>
<td>F-E</td>
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<td>perennial</td>
<td>Stolons</td>
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<td>P-F</td>
<td>P-F</td>
<td>G-E</td>
<td>F-P</td>
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<td>Stolons</td>
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<td>P-F</td>
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<td>VH</td>
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<td>Annual Ryegrass Lolium multiflorum</td>
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<td>VH</td>
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<td>M-H</td>
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<td>G-E</td>
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<td>Spring, Fall</td>
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<tr>
<td>Festulolium Festulolium spp.</td>
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<td>Bunch</td>
<td>Spring, early Summer, Fall</td>
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<td>F-G</td>
<td>G</td>
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<td>-</td>
<td>G</td>
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<td>Orchardgrass Dactylis glomerata</td>
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<td>Spring, Summer, Fall</td>
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<td>450,000</td>
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<td>F-G</td>
<td>P-G</td>
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<td>M-H</td>
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<td>11.2 to 16.0</td>
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<tr>
<td>Tall Fescue Festuca arundinacea</td>
<td>perennial</td>
<td>Bunch, short rhizomes</td>
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<td>H</td>
<td>G</td>
<td>E</td>
<td>G-E</td>
<td>16.8 to 22.4</td>
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<tr>
<td>Timothy Pteum pratense</td>
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<td>Bunch</td>
<td>Spring, Fall</td>
<td>7 to 25</td>
<td>1,152,000</td>
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<td>P</td>
<td>E</td>
<td>F</td>
<td>G-G</td>
<td>Timothy Pteum pratense</td>
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<td>L-H</td>
<td>M-H</td>
<td>F-E</td>
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<td>H</td>
<td>-</td>
<td>G</td>
<td>E</td>
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<tr>
<td>Smooth Brome Bromus inermis Leyss.</td>
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<td>Rhizomes</td>
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<td>E</td>
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<td>H</td>
<td>M-H</td>
<td>-</td>
<td>P</td>
<td>13.4 to 20.2</td>
<td>5.6 to 7.8</td>
<td>2.2 to 13.4</td>
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</table>

E = Excellent, G = Good, F = Fair, P = Poor
VH = Very High, H = High, M = Medium, L = Low