Section C. Plant Profiles

Grasses

Photo: Casey Dinkel,AK PMC

Bluejoint reedgrass, *Calamagrostis canadensis*

Alpine Bluegrass, *Poa alpina*
American Sloughgrass, *Beckmannia syzigachne*
Annual Ryegrass, *Lolium multiflorum*
Beach Wildrye, *Leymus mollis*
Bering Hairgrass, *Deschampsia beringensis*
Bluejoint Reedgrass, *Calamagrostis canadensis*
Kentucky Bluegrass, *Poa pratensis*
Meadow Barley, *Hordeum brachyantherum*
Meadow Foxtail, *Alopecurus pratensis*
Polargrass, *Arctagrostis latifolia*
Red Fescue, *Festuca rubra*
Siberian Wildrye, *Elymus sibiricus*
Slender Wheatgrass, *Elymus trachycaulus*
Smooth Brome, *Bromus inermis*
Spike Trisetum, *Trisetum spicatum*
Timothy, *Phleum pratense*
Tufted Hairgrass, *Deschampsia cespitosa*

ALPINE BLUEGRASS

Photo: Casey Dinkel,AK PMC

A mature stand of Alpine Bluegrass

Alpine Bluegrass

Poa alpina (L.)

Description

Poa alpina (Alpine Bluegrass) is a cool season perennial bunch grass that grows in mountainous areas. It is relatively short, growing erect culms between 15 and 20 centimeters (6 to 8 inches) tall. Alpine Bluegrass has short leaves, a tight crown, and an inflorescence that is from 2.5 to 5 cm (1-2 inches) long. Alpine Bluegrass is a pioneer species, and is usually long lived. The grass grows a small to medium seed and produces about 1,070,000 seeds per pound of seed.

Uses

Livestock: Alpine Bluegrass is palatable to all classes of livestock, such as cattle, sheep and horses. However, it does not produce a large amount of forage.

Wildlife: Alpine Bluegrass provides excellent forage for elk, deer, mountain sheep and bison. It is moderately palatable to all classes of wildlife, and is often used on big game ranges.

Forage Value

Alpine Bluegrass produces high quality forage for most classes of livestock and wildlife. It provides an ample protein supply, but forage yields are usually moderate to low. This grass is palatable for both livestock and wildlife. Alpine Bluegrass has moderate digestibility in comparison with other forage grasses.

Distribution and Adaptation

Alpine Bluegrass can be found growing in sub-alpine to alpine regions throughout Alaska. It has a pH range of 5 to 7.2, and typically prefers moderately fine to moderately coarse textured or well drained soils. Alpine Bluegrass is not tolerant of highly saline or waterlogged soils, but it can withstand prolonged periods of drought. Alpine Bluegrass has low nutrient needs, and will tolerate most nutrient deficient soils.

Culture

Alpine Bluegrass seed should be planted ¼ to ½ inches deep in coarsely textured soils, and ¼" or shallower in finely textured soils. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 4-8 lbs/acre and 2-4 lbs/acre when drill seeding. When seeded in a mixture, apply at a rate of 4-6 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Alpine Bluegrass is best suited for pasture land use but it does not respond well to heavy grazing, and new seedlings should be protected from grazing if possible. Little research has been done to examine the effects fertilizer and irrigation might have on Alpine Bluegrass yields. Alpine Bluegrass should not be grown in conjunction with Annual Ryegrass, as ryegrass has negative allelopathic effects. At the present time there are no known major pests that threaten Alpine Bluegrass.

Photo: Stoney J. Wright, AK PMC

Alpine Bluegrass, Poa alpina

Cultivars and Releases

- '**Gruening**' - *Alaska PMC release.*

A W I SW SC SE

- **Teller** - selected class germplasm; *Alaska PMC release.*

W I SW SC SE

References

Wright, S.J. and P.K. Czapla (2010) Alaska Coastal Revegetation & Erosion Control Guide, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 234 pp Link: http://dnr.alaska.gov/ag/akpmc/reveg/

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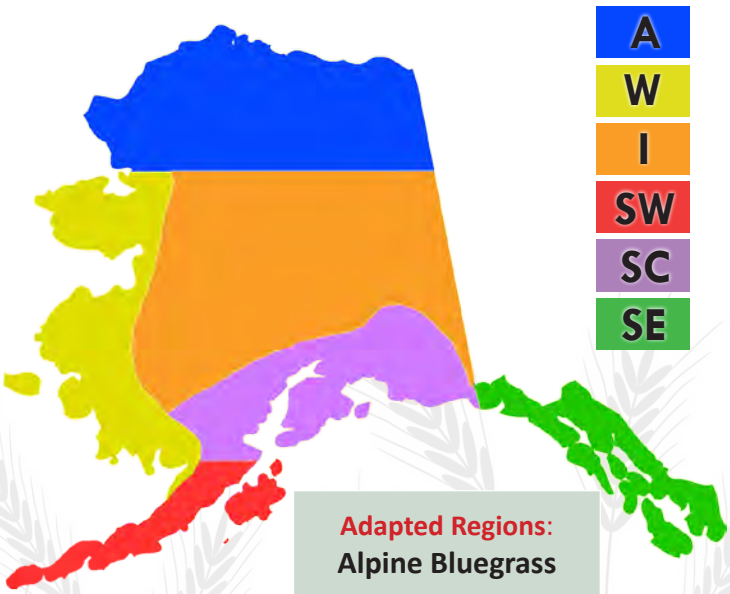
Pawnee Buttes Seed Inc. (2004) A Guide to Grasses, Pawnee Butte Seed Inc., Greeley, Colorado. 107 pp [online] Link: http://www.pawneebuttesseed.com/guide_to_grasses.htm

Skinner, Q.D, Wright, S.J., Henszey, R. J., Henszey, J.L. and Wyman, S.K. (2012) A Field Guide to Alaska Grasses, Education Resources Publishing, Cummings Georgia. 384 pp

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	0

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Species not adapted to region

Adapted Regions:
Alpine Bluegrass

- All Regions

see variety detail at left

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Bunch	6 - 8 in.	Native	Poor	Good	Poor	Weak	5 - 7.2

AMERICAN SLOUGHGRASS

Photo: Brennan Veith Low, AK PMC

A mature stand of American Sloughgrass

American Sloughgrass

Beckmannia syzigachne (L.)

Description

Beckmannia syzigachne (American Sloughgrass) is a short lived perennial grass that is commonly found in shallow marshes or sloughs. Its shallow root system supports a leafy stem which may be up to 45 centimeters (18 inches) tall. Branched inflorescence, classified as closed panicle. Spikelets have very short pedicels that are arranged on only one side of the panicle. One or two flowered spikelets disarticulate below the glumes. There are approximately 1,270,000 American Sloughgrass seeds per pound of seed.

Uses

Livestock: American Sloughgrass can be used for hay meadows or pasture land. It is highly palatable to all classes of livestock, such as cattle, sheep and horses.

Wildlife: American Sloughgrass is an important component of Alaskan wetland environments. The grass provides shelter and food for wildlife such as waterfowl, songbirds and various small mammals.

Forage Value

American Sloughgrass is highly palatable and a valuable forage species. It has good energy and high protein value. American Sloughgrass is also know to contain high amounts of nonstructural carbohydrates. Livestock and wildlife generally concentrate in the wet meadows and riparian areas where American Sloughgrass grows.

Distribution and Adaptation

American Sloughgrass grows wild in Alaska and the northern United States in wet meadows, marshes and swamps. It is also grown and used as forage in parts of Europe and Russia. American Sloughgrass generally prefers a pH ranging from 5.5 to 7.5. It is commonly found growing in areas that receive at least 30 inches of precipitation per year.

Culture

An average broadcast seeding rate for American Sloughgrass is 10 lbs/acre. A rate of 5 lbs/acre is used when drill seeding, or when seeded in a mixture. American Sloughgrass seed should be planted to a depth of $^{1}/_{4}$ - $^{1}/_{2}$ inch. Be mindful of this grass's high water requirement when choosing a growing site. If the planting site is dry at the time of seeding, irrigation may be necessary. American Sloughgrass seed should be planted in moist to wet soils that are of medium to fine texture. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied.

Management

American Sloughgrass normally produces an abundance of seed that will readily germinate upon reaching a suitable growing site. It can be feasible to use American Sloughgrass on seasonally inundated sites where grain production is unpredictable. American Sloughgrass's vigorous growth habit is suited to sites where temporary, yet productive, cover is desired. The seed unit that falls from the inflorescence at maturity is a firm, free flowing spikelet that presents no difficulties for conventional planting equipment.


Photo: Casey Dinkel, AK PMC

American Sloughgrass, Beckmannia syzigachne

Cultivars and Releases

- **'Egan'** - *Alaska PMC release.*

W I SW SC SE

References

Wright, S.J. and P.K. Czapla (2010) Alaska Coastal Revegetation & Erosion Control Guide, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 234 pp Link: http://dnr.alaska.gov/ag/akpmc/reveg/

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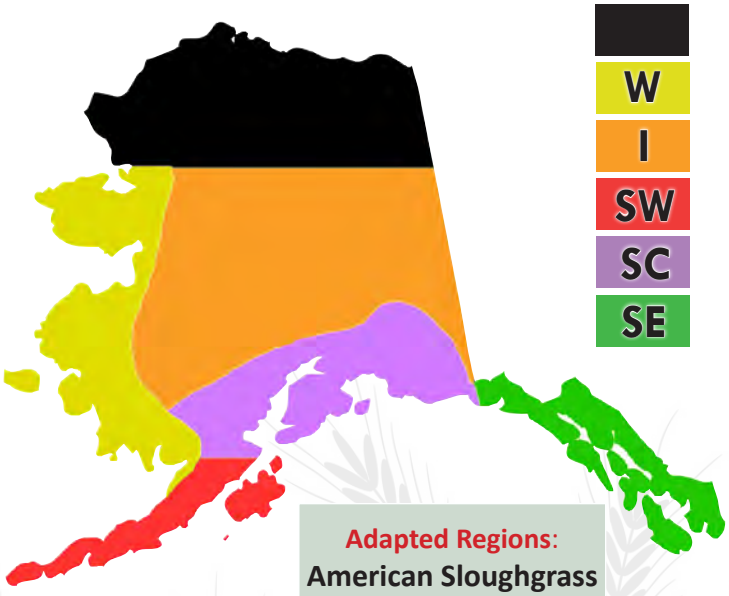
Natural Resource Conservation Service (NRCS) (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

Skinner, Q.D, Wright, S.J., Henszey, R. J., Henszey, J.L. and Wyman, S.K. (2012) A Field Guide to Alaska Grasses, Education Resources Publishing, Cummings Georgia. 384 pp

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	3	2

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
American Sloughgrass

- Western
- Interior
- Southwest
- Southcentral
- Southeast

Species not adapted to region

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	18 in.	Native	Good	Poor	Excellent	Moderate	5.5 - 7.5

ANNUAL RYEGRASS

A mature stand of Annual Ryegrass

Annual Ryegrass

Lolium multiflorum (L.)

Description

Lolium multiflorum (Annual Ryegrass) is an annual, cool-season, introduced bunch grass. This grass grows erect or decumbent culms between 30 to 60 centimeters (12 to 24 inches) tall. Annual Ryegrass's foliage is usually glossy and produces a spike inflorescence that is between 7 to 15 cm (3 to 6 inches) long. As with most annual grasses, Annual Ryegrass produces a small root structure. This grass produces a medium size seed that grows at a rapid rate. Annual Ryegrass produces approximately 240,000 seeds per pound of seed.

Always use ryegrass labeled for "forage or pasture use". Some available varieties can be toxic. Non-forage types can contain harmful endophytes.

Uses

Livestock: Annual Ryegrass is used for pasture, hay, or silage. It is highly palatable to all classes of livestock, including cattle, sheep and horses.

Wildlife: Annual Ryegrass is consumed by most classes of large wildlife, such as bison, elk, deer, and mountain sheep. Small mammals and song birds will also utilize this grass when available.

Forage Value

Annual Ryegrass produces good quality forage for most classes of livestock and wildlife. It is considered to have high palatability for grazing animals and low palatability for browsing species. This grass has a moderate digestibility, and makes an excellent forage crop when planted with legumes.

Distribution and Adaptation

Annual Ryegrass can be found growing throughout most of North America. Introduced from Europe, it is adapted to cool moist climates, like those found in the Pacific Northwest. Although it can be found growing in Alaska, it will not persist due to its inability to over winter in harsh climates. It can tolerate a pH range of 5 to 8, and typically prefers moderately course to moderately fine textured soils. Annual Ryegrass will not persist during prolonged periods of drought, but it will tolerate areas of high moisture. This grass can withstand highly saline and nutritionally deprived soils.

Culture

Annual Ryegrass seed should be planted no deeper than ½ inch in most soil conditions. It is commonly planted in mixtures with legumes or small grains. Annual Ryegrass seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 8-16 lbs/acre and 4-8 lbs/acre when drill seeding. When Annual Ryegrass is seeded in a mixture, apply at a rate of 6 - 10 lbs/acre. Seeding rates should be increased by 5 - 10 lbs/acre when planting on poor seedbeds or harsh sites. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilizer should increase overall yields.

Management

Annual Ryegrass is excellent for temporary pastures or early growth on permanent pastures. This grass should be seeded with other pioneer grass species, due to its short life cycle. Annual Ryegrass will succumb to winters in Alaska. It is also prone to several types of rust disease, although the species is somewhat resistant. Annual Ryegrass requires ample moisture and irrigation should be applied when necessary.

Photo: Casey Dinkel, AK PMC

Annual Ryegrass, Lolium multiflorum

Cultivars and Releases

- There are currently no developed northern cultivars or releases of Annual Ryegrass. Use of locally grown cultivars is advised whenever possible.

References

Wright, S.J. and P. Hunt (2008) A Revegetation Guide for Alaska, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 160 pp Link: http://dnr.alaska.gov/ag/akpmc/pdf/RevegManual.pdf

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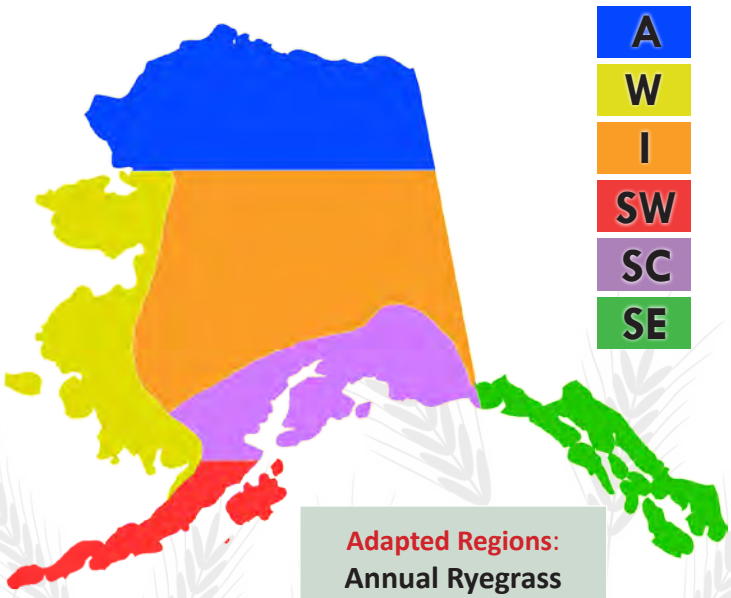
Maurice, E.H., D.S. Metcalfe and R.F. Barnes, (1973) Forages, The Science of Grassland Agriculture. University of Iowa State, Iowa State University Press. Ames, Iowa. 755 pp

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Annual Ryegrass

- All Regions

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	12 - 24 in.	Introduced	Excellent	Low	Excellent	Strong	5 - 8.0

BEACH WILDRYE

A mature stand of Beach Wildrye

Beach Wildrye

Leymus mollis (L.)

Description

Leymus mollis (Beach Wildrye) is a long lived, cool season, perennial sod forming grass. It grows erect culms 50 to 60 centimeters (20 to 24 inches) tall, from long creeping rootstocks. Beach Wildrye produces stout, aggressive rhizomes, which increases its ability to spread. Leaves vary in length from 25 to 51 cm (10 to 20 inches), and are coarse-textured. The inflorescence is a stiff spike that is 10 - 25 cm (4 to 10 inches) in length and roughly 13 mm (½ inch) wide. Beach Wildrye produces a large sized seed (33,000 seed per pound) and has low seedling vigor and germination rate. A fifty percent germination percentage for Beach Wildrye seed should be considered acceptable.

Uses

Livestock: Beach Wildrye can be used for pasture or silage. It is moderately palatable to a select class of livestock, such as cattle. This grass can be useful forage if grazed or cut for silage at the optimum growth stage.

Wildlife: Beach Wildrye is utilized by small mammals and song birds for forage and cover. Due to its limited range and moderate palatability, it is generally not consumed by large grazing or browsing animals such as moose, caribou, elk or bison.

Forage Value

Beach Wildrye produces a moderate forage yield compared to other forage grasses such as Smooth brome or Timothy. Its palatability for browsers is moderate to low. Beach Wildrye provides moderate to low nutritional value, depending upon when it is cut or grazed. This grass is usually easily digested, but can cause impaction problems in horses if consumed when the moisture content of the grass is low.

Distribution and Adaptation

Beach Wildrye is adapted to tidal and coastal areas and can be found growing along the coast of Alaska. It prefers coarse textured, sandy and/or well drained soils. Beach Wildrye will grow well in soils with a pH between 6.0 and 8.0. This grass can tolerate excessively wet and droughty conditions, and can withstand saline soils.

Culture

Beach Wildrye is commonly grown by planting sprigs from existing plants. A sprig is the smallest division taken from a live plant to grow a new plant. Survival percentage is greater when Beach Wildrye sprigs are planted than from seed. If using seed, drill to a depth of ¼ to ½ inch. Seeding rates depend greatly upon soil type, moisture, and location. The seeding rates below only apply to 'Reeve' Beach Wildrye, and the European species *Leymus arenarius*. An average rate for broadcast seeding of Beach Wildrye is 60 lbs/acre, and 30 lbs/acre when drill seeding. Including Beach Wildrye seed in a mixture is not recommended due to its weak ability to compete with other plants. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Beach Wildrye is highly responsive to nitrogen fertilizer. 20N-20P-20K fertilizer applied at a rate of 500 to 600 lbs/acre yield good results.

Management

Beach Wildrye may be severely damaged or destroyed from traffic that causes compaction. Digestive impaction may occur in horses if grazed when the moisture content is low. A fungus and pest called ergot can replace or destroy Beach Wildrye seed. Ergot occasionally occurs in many cereal crops and other various grass species. This fungus can be poisonous if consumed by animals and should be avoided.


Photo: Casey Dinkel, AK PMC

Beach Wildrye, Leymus mollis

Cultivars and Releases

- '**Benson**' *(Leymus mollis) - Alaska PMC release;* Available only as vegetative cuttings (sprigs).

[ ] W [ ] SW SC SE

- **'Reeve'** (*Leymus arenarius*) - *Alaska PMC release;* Available as seed.

[ ] W [ ] SW SC SE

References

Wright, S.J. and P.K. Czapla (2010) Alaska Coastal Revegetation & Erosion Control Guide, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 234 pp Link: http://dnr.alaska.gov/ag/akpmc/reveg/

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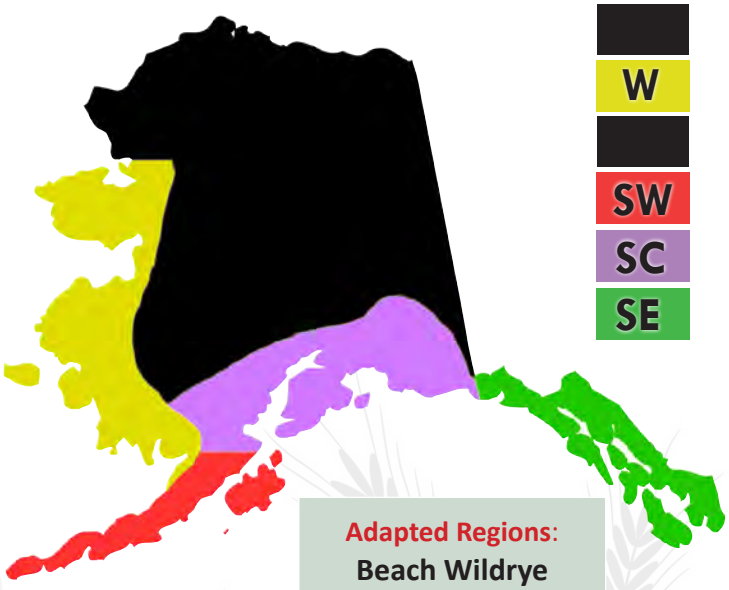
Hulten, E. (1968) Flora of Alaska and Neighboring Territories. Stanford University press. Stanford California. 1008 pp

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
2	3	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Beach Wildrye

- Western
- Southwest
- Southcentral
- Southeast

see variety detail at left

[ ] *Species not adapted to region*

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Sod	24 in.	Native	Excellent	Good	Good	Weak	6.0 - 8.0

BERING HAIRGRASS

Photo: Stoney J. Wright, AK PMC

Bering Hairgrass has tufted leaves and a branched inflorescence

Bering Hairgrass

Deschamspia beringensis (L.)

Description

Deschampsia beringensis (Bering Hairgrass) is a highly variable, perennial, cool season bunch grass. The species grows from 50 to 60 centimeters (20 - 24 inches) tall. Stems are erect, and the leaves are between 1.5 - 4 mm (.06 and .16 inches) wide, flat or rolled. The leaves are mostly basal in a dense tuft. Bering Hairgrass's inflorescence is a loosely branched, open panicle from 10 - 25 centimeters (4 to 10 inches) in length. There are two florets (flowers) per spikelet. Flowering occurs from May to September. Bering Hairgrass seeds mature from late June to late September, depending on location. *Deschampsia beringensis* produces approximately 1,360,000 seeds per pound of seed.

Uses

Livestock: Bering Hairgrass can be utilized as hay or as a pasture crop. It is used by cattle, horses, and sheep. The palatability of Bering Hairgrass is moderate to low for most classes of livestock.

Wildlife: A large variety of wildlife utilize Bering Hairgrass for cover. Most wildlife will not typically utilize the species as often as domestic livestock. Bering Hairgrass has moderate to low palatability for elk, bison and moose.

Forage Value

Bering Hairgrass produces good quality hay for most classes of livestock and wildlife. Hairgrass provides ample amounts of protein, depending on its growing stage. Bering Hairgrass can provide good summer pasture forage, however most livestock find this grass unpalatable. As a result, an animal's diet may consist of only 1-3% Bering Hairgrass.

Distribution and Adaptation

Bering Hairgrass populations occupy moist to seasonally flooded, sunny environments. Bering Hairgrass is adapted to a pH range from 5.5 to 7.2. Salinity tolerance is generally low, but plants growing in coastal estuaries may be slightly more salt tolerant. Bering Hairgrass habitat includes coastal terraces, upper tidal marshes, seasonally wet prairies, and moist subalpine mountain meadows.

Culture

When planting Bering Hairgrass, seed should be planted ¼ to ½ inch deep. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 12 lbs/acre and 6 lbs/acre when drill seeding. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary. Irrigation in combination with fertilization should increase overall yields.

Management

Bering Hairgrass is adapted to coastal regions and is well suited for Alaska's maritime environments. One should be aware that Bering Hairgrass grows aggressively and tends to compete with other grass species. Several diseases are associated with Bering Hairgrass, including ergot, stripe smut, blind seed and several turf diseases. Hairgrass is also vulnerable to several leaf spots and rusts. Insect pests such as aphids, billbugs, and leafhoppers can threaten stands of Bering Hairgrass, and should be monitored.

Photo: Brennan Veith Low, AK PMC

Bering Hairgrass, Deschampsia beringensis

Cultivars and Releases

- **'Norcoast'** - *University of Alaska Fairbanks release.*

A W I SW SC SE

References

Wright, S.J. and P.K. Czapla (2010) Alaska Coastal Revegetation & Erosion Control Guide, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 234 pp Link: http://dnr.alaska.gov/ag/akpmc/reveg/

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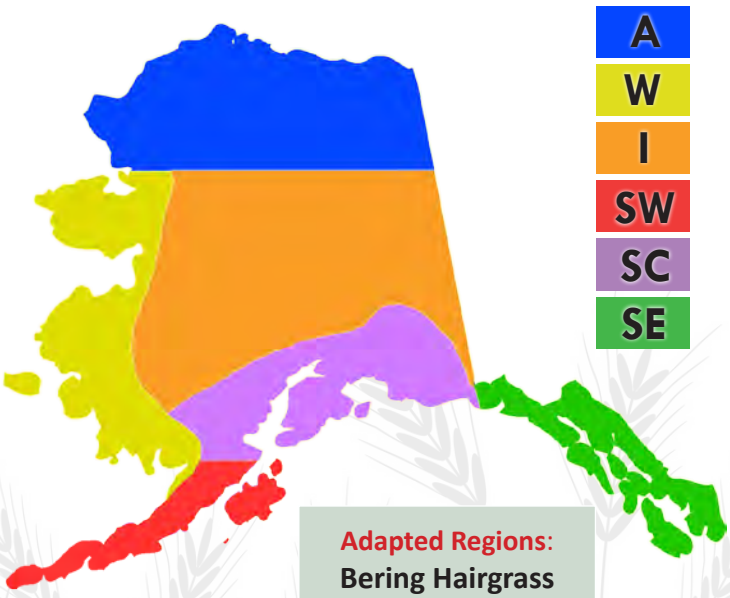
Natural Resource Conservation Service (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	3	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Bering Hairgrass

- All Regions

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	20 - 24 in.	Native	Poor	Good	Good	Strong	5.5 - 7.2

BLUEJOINT REEDGRASS


Photo: Casey Dinkel, AK PMC

Bluejoint Reedgrass, Calamagrostis canadensis

Bluejoint Reedgrass

Calamagrostis canadensis (L.)

Description

Calamagrostis canadensis, Bluejoint Reedgrass is a tall, erect, cool season perennial grass that is found in wet meadows and prairies. The creeping rhizomes and rootstocks result in natural stands having a hummocky, uneven appearance. Erect culms are slender, not branched; grow to be 90 to 100 centimeters (36 to 40 inches) tall. Leaves are bluish green, elongated and very narrow; rough to the touch. The caryopses are ellipsoidal, yellow-brown, smooth, and about .76 to 1.27 mm (.03 -.05 inches) long. Inflorescence (seed-head) open panicle with single caryopsis borne in each spikelet (Barkley, 1986). Bluejoint flowers from June to August and is a typical wind pollinated species like most grasses. *Calamagrostis canadensis* produces approximately 2,720,000 seeds per pound of seed.

Uses

Livestock: Bluejoint may be used for hay or pasture land. Cattle, sheep and horses find this grass highly palatable during early growth prior to seedhead formation.

Wildlife: Bluejoint is utilized by bison, elk and deer, especially during the early portion of the growing season. It also has value as food and cover for waterfowl, small rodents, and some upland game birds.

Forage Value

Bluejoint furnishes excellent forage for livestock and some wildlife. As this grass matures, it quickly becomes tough and unpalatable, causing protein values to drop considerably and crude fiber content to increase. Bluejoint makes favorable hay and is palatable forage if managed properly. However, when putting effort and expense into seedbed preparation, one should consider growing more desirable forage grasses than Bluejoint Reedgrass. Seed availability is poor and prices are usually high for this species.

Distribution and Adaptation

Stands of Bluejoint can tolerate a thick build up of litter and mulch. This species can be found in highly organic peat and clay soils, but prefers a silty soil. Bluejoint is adapted to a wide range of temperatures (-40 °F to 105 °F) and precipitation regimes. It is extremely winter hardy.

Bluejoint has broad ecological adaptations; occurring in a wide range of environments - from lowland wetlands to wind-swept alpine ridges. The species has a wide pH tolerance (pH 4.5 to 8), from very acidic to moderately alkaline soils. Bluejoint can tolerate fresh to slightly brackish water.

Culture

An average broadcast seeding rate for Bluejoint is 6 - 8 lbs/acre. When drill seeding, 2 - 4 lbs/acre is appropriate. Fall seedings should be made at least 6 weeks before a killing frost is expected. Seedings should be drilled at a depth of $^{1}/_{4}$ inch and no deeper than $^{3}/_{8}$ of an inch if possible. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Bluejoint responds well to nitrogen, which has been shown to increase protein levels and overall forage yields. Pastures and hay fields should be irrigated when necessary. Irrigation, in combination with fertilization, should increase overall yields.

Management

Bluejoint is intolerant of heavy grazing and/or repeated harvests. Heavy trampling by livestock or wildlife can break the rhizomes and add to soil compaction in wetter areas. When over 40 percent of the plant is grazed, future yields can decrease by 15-20 percent. Harvesting should be restricted to a single cutting per growing season. When unfertilized and subjected to frequent grazing or harvest, Bluejoint stands are often damaged and persistence is poor.

Fertilized stands of Bluejoint may produce 2 or 3 times more total forage than unfertilized stands. Also, fertilized stands can produce 10-20% higher protein yields and are considered more palatable for livestock and wildlife. Problems can occur with virgin stands of Bluejoint Reedgrass due to the large amount of surface debris that can accumulate from previous years' growth. This hummocky layer can prevent top dressed fertilizers from reaching the living grass root zone. This layer can be removed by burning, blading, or mechanical mixing of the surface organic layer.

Several potential pests have been associated with Bluejoint Reedgrass throughout the lower 48 states and parts of Alaska. The nematode *Subanguina calamagrostis* invades the leaf tissue of the grass, forming galls that cause the leaves to become twisted and contorted. A fungus, *Dilophospora alopecuri*, can then invade the leaves of Bluejoint Reedgrass, using the entry wound caused by the aforementioned nematode.

Cultivars and Releases

- '**Sourdough**' - *University of Alaska Fairbanks release.*

A W I SW SC SE

Photo: Brennan Veith Low, AK PMC

A mature stand of Bluejoint Reedgrass

References

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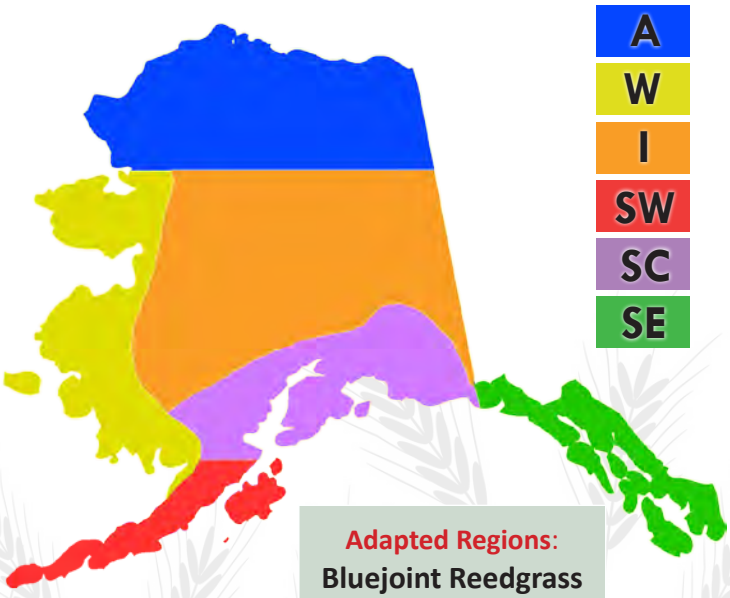

Adapted Regions:
Bluejoint Reedgrass

- All Regions

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	3	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Sod	36 - 40 in.	Native	Poor	Good	Good	Strong	4.5 - 8

KENTUCKY BLUEGRASS


Photo: Alaska PMC

Kentucky Bluegrass, Poa pratensis

Kentucky Bluegrass

Poa pratensis (L.)

Description

Poa pratensis (Kentucky bluegrass) is a perennial, cool-season, sod-forming grass native to Europe. This plant is about 45 to 60 centimeters (18 - 24 inches) tall, although this height falls to 10 to 15 cm (4 - 6 inches) when intensively grazed. Inflorescence (seed-head) has an open panicle and produces many small seeds. There are about 2,177,000 seeds per pound of seed.

Leaves are from 15 to 30 cm (6 to 12 inches) long, and boat-shaped (keeled) at the tips. Leaves are smooth, soft, and about 3 - 7 mm ($^1/_8$ to $^1/_4$ inch) wide. Kentucky bluegrass becomes dormant during the heat of summer, but regains its green color in fall. Growth starts early in the spring. Tiller buds develop into stems or rhizomes. New rhizomes also arise from nodes of older rhizomes. Most rhizomes will penetrate 2 to 4 inches into the soil, but some go down more than 5 inches.

Uses

Livestock: Kentucky bluegrass is typically used for pasture land rather than as a hay crop, due to its shorter growing height. It is highly palatable to cattle, horses and sheep early in the spring, before other plants begin to grow. Kentucky bluegrass produces relatively low yields compared to other pasture grasses.

Wildlife: Kentucky bluegrass is highly palatable to bison and elk. The tender plants are grazed immediately after growth begins, and the leaves remain succulent and green as long as soil moisture is present. *Poa pratensis* seeds are also eaten by several kinds of songbirds and rodents.

Forage Value

Kentucky bluegrass is excellent forage grass for most livestock and wildlife. It provides adequate nutritional value in the early spring before other plant species emerge. Once Kentucky bluegrass develops seed, the forage value and palatability drop considerably. Kentucky bluegrass is commonly used for pasture land, but considered undesirable for hay fields because of its low growth form, poor yield, and early maturity.

Distribution and Adaptation

Kentucky bluegrass is used throughout the U.S. It is best adapted to well-drained, fertile, medium-textured soils of limestone origin. Performance on poorly drained and heavy-textured soils is satisfactory. Favorable pH level for Kentucky bluegrass is between 6.0 and 7.5. Kentucky bluegrass grows best in humid areas. Optimum temperatures for forage production are between 60 °F and 90 °F. Kentucky bluegrass is essentially dormant during dry or excessively hot weather, allowing it to survive extreme temperatures. It grows best with direct sunlight, but will do well in the shade, so long as ample moisture and nutrients are available.

Culture

An average broadcast seeding rate for Kentucky bluegrass is 6 - 10 lbs/acre; a rate of 2 - 4 lbs/acre is used for drill seeding or when seeded in mixtures. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B. Kentucky bluegrass seed should be planted to a depth of $^1/_4$ inch to $^1/_2$ inch.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. A pasture containing Kentucky bluegrass should be irrigated when necessary. Irrigation in combination with fertilization should increase overall yields.

Management

Proper fertilization and liming are the most important phases of Kentucky bluegrass management. For pastures, grazing should begin when grass is about 5 inches tall. Kentucky bluegrass should not be grazed shorter than 1-$^1/_2$ to 2 inches. Otherwise, sod will become weedy and unproductive. When overgrazed, poor root and rhizome development occurs, allowing weeds and shrubs to invade the pasture.

Kentucky bluegrass is susceptible to attack by many diseases and insects. It is sometimes vulnerable to fungal infections, leaf spot, rust and powdery mildew. Depending on region, the grass is also susceptible to white grubs, billbugs, and sod webworms.

A field of Kentucky Bluegrass in southcentral Alaska

Cultivars and Releases

- '**Nugget**' - *released by University of Alaska Fairbanks.*

I SC SE

- '**Park**' - *released from Minnesota*

I SC SE

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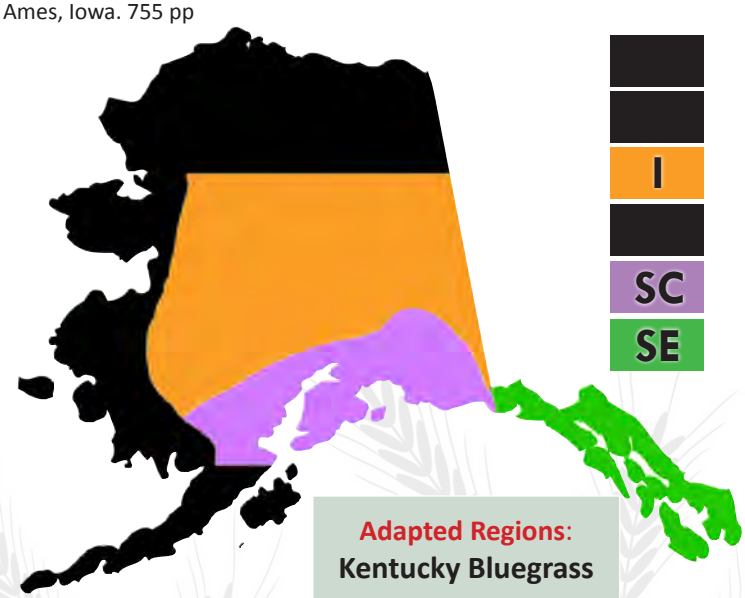
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	3	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Kentucky Bluegrass

- Interior
- Southcentral
- Southeast

see variety detail at left

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Sod	18 - 24 in.	Introduced	Poor	Poor	Good	Moderate	6 - 7.5

MEADOW BARLEY

Photo: Casey Dinkel, AK PMC

Meadow Barley has a narrow panicle with a purplish hue.

Meadow Barley

Hordeum brachyantherum (L.)

Description

Hordeum brachyantherum (Meadow Barley) is a short to intermediate lived, cool season, perennial bunch grass. It grows semi erect to erect culms 38 - 75 centimeters (15 to 30 inches) in height. Leaves are green to bluish green, and are 3 to 6.5 mm (1/8 to 1/4 inch) wide. The inflorescence, or seed-head, is a narrow panicle that is 2.5 - 10 cm (1 to 4 inches) in length and often of purplish color. This grass produces a medium sized seed with good seedling vigor. Meadow Barley seed possesses bristle like awns and non-viable florets that should be removed for easier seed flow through planting machinery. Seed per pound can vary widely depending upon the degree of seed conditioning. Bulky seed may contain 30,000 to 100,000 seeds/lb, while highly processed seed can have upwards of 150,000 seeds per pound of seed.

Uses

Livestock: Meadow Barley can be used for pasture land or hay. It has moderate to low palatability for most classes of livestock. Palatability is higher if grazed in early spring before setting seed. Meadow Barley starts its growth in the early spring and matures in early to mid September.

Wildlife: Meadow Barley is considered to have low palatability for most large wildlife animals, such as elk, bison, and moose. However, deer are known to utilize Meadow Barley in the spring, when nutrient values are still high. Small mammals, song birds, and water fowl may use this grass for cover and food, throughout various stages of its life cycle.

Forage Value

Meadow Barley produces a marginal amount of protein and is utilized most often by large grazing animals in the early spring. As with most grasses, nutritional value and digestibility diminish substantially after seed development or without adequate moisture.

Distribution and Adaptation

Meadow Barley is adapted to cool climates and can be found growing in wet meadows, salt marshes, along beaches, and riparian areas. This grass is adapted to finer textured soils like silts and clays but can also tolerate coarser textured soils that have adequate moisture. It prefers soils with a pH of 6.0 - 8.5, and will not persist well in acidic environments. Meadow Barley has a moderate tolerance to drought conditions. It can also tolerate low nutrient and high saline soils.

Culture

Meadow Barley seed should be planted ¼ to ½ inch deep when drill seeded. This grass establishes easily and has high seedling vigor. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcast seeding is 4-8 lbs/acre, or 2-4 lbs/acre when drill seeding. When seeded in a mixture, apply at a rate of 4-6 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary. Irrigation, in combination with fertilization, should increase overall yields.

Management

Meadow Barley is responsive to irrigation and should be irrigated if planted on drier sites. It does not respond well to heavy grazing and pasture deferment should be considered for healthy stands to persist. This grass may be susceptible to several fungal diseases such as head smut and/or leaf and stem rust. Meadow Barley's bristly awn can cause harm to some animals by working its way into the nose, mouth, and intestine.

Photo: Brennan Veith Low, AK PMC

Meadow Barley, Hordeum brachyantherum

Cultivars and Releases

- **Lowell Point** selected class germplasm;
  - Alaska PMC release.

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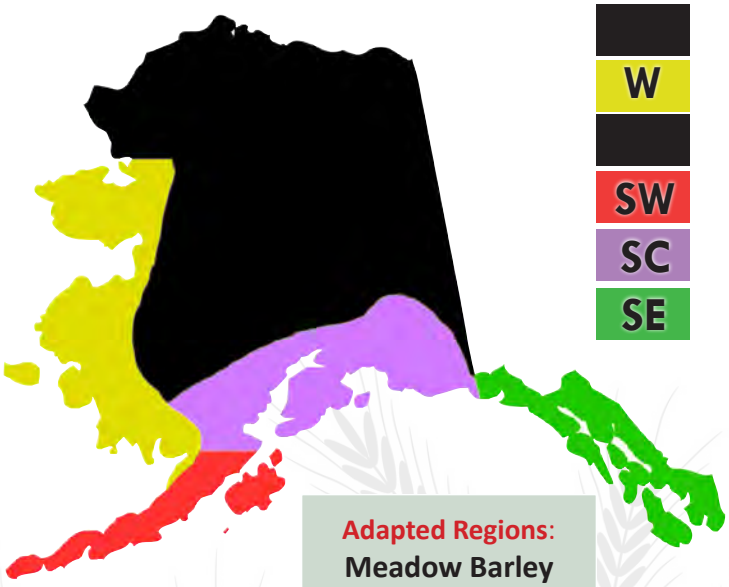
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	3	2

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Meadow Barley

- Western
- Southwest
- Southcentral
- Southeast

Species not adapted to region

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Bunch	24 in.	Native	Good	Good	Good	Weak	6.0 - 8.5

MEADOW FOXTAIL

Meadow Foxtail, Alopecurus pratensis

Meadow Foxtail

Alopecurus pratensis (L.)

Description

Alopecurus pratensis (Meadow Foxtail) is a long lived, cool season, perennial bunch grass. It grows decumbent or erect culms 30 to 50 centimeters (12 to 20 inches) tall. Leaves vary in length from 5 to 30 cm (2 - 12 inches), and are roughly 6 to 13 mm (1/4 to 1/2 inch wide). Meadow Foxtail's inflorescence is a dense panicle and is 2.5 to 7.5 cm (1 to 3 inches) in length, and usually about 6 to 13 mm (1/4 to 1/2 inch) wide. This grass produces a medium size seed, which retains a hairy pubescence making it light and/or fluffy. Once established, Meadow Foxtail has high seedling vigor. Meadow Foxtail produces approximately 406,000 seeds per pound of seed.

Uses

Livestock: Meadow Foxtail can be used for pasture, hay, or silage. It is highly palatable to all classes of livestock, such as cattle, sheep, and horses. Meadow Foxtail starts its growth in early spring and provides livestock with adequate forage.

Wildlife: Meadow Foxtail has moderate palatability for most classes of wildlife. Grazers such as elk and bison tend to select Meadow Foxtail more often than moose. It is also utilized by small mammals and song birds.

Forage Value

Meadow Foxtail produces moderate amounts of protein and is excellent quality forage for large grazing animals. It possesses good nutritional value and digestibility similar to that of Timothy (*Phleum pretense*). Browsers such as moose do not find Meadow Foxtail to be as palatable as do grazing animals like cattle, bison and elk. As with most grasses, nutritional value diminishes substantially after seed development or without adequate moisture.

Distribution and Adaptation

Meadow Foxtail is adapted to cool, wet climates. It can be found growing in hay meadows, irrigation ditches, and along stream banks. Meadow Foxtail prefers fine-textured or poorly drained soils, such as silts and clays. This grass performs well in soils with a pH ranging from 5.8 to 8.0. Meadow Foxtail has a moderate tolerance to droughty and saline environments. *Alopecurus pratensis* can be found growing throughout most of Alaska, and portions of Canada and the United States.

Culture

Meadow Foxtail seed should be planted a ¼ to ½ inch deep, when drill seeded. This grass can be difficult to establish, but once in place seedling vigor is considered high. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 4-8 lbs/acre and 2-4 lbs/acre when drill seeding. When Meadow Foxtail is seeded in a mixture, apply at a rate of 4-6 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Meadow Foxtail makes an excellent pasture, hay, or silage forage crop. It is less winter-hardy than Smooth Brome (*Bromus inermis*) but is more tolerant of acidic soils. Meadow Foxtail is found in areas with milder winters and more acidic soils, such as the Kenai Peninsula. Meadow Foxtail can be problematic when planting with a drill seeder, due to the hairy pubescence that remains on the seed after cleaning. To reduce mechanical problems, Meadow Foxtail can be planted along with other grass or legume species. It responds well to grazing as long as there is ample moisture. At present, there are no major pests in Alaska that threaten Meadow Foxtail.

Photo: Paul Slichter, Pacific Northwest Wildflowers

A mature stand of Meadow Foxtail

Cultivars and Releases

- There are no developed northern cultivars or releases of Meadow Foxtail at present.

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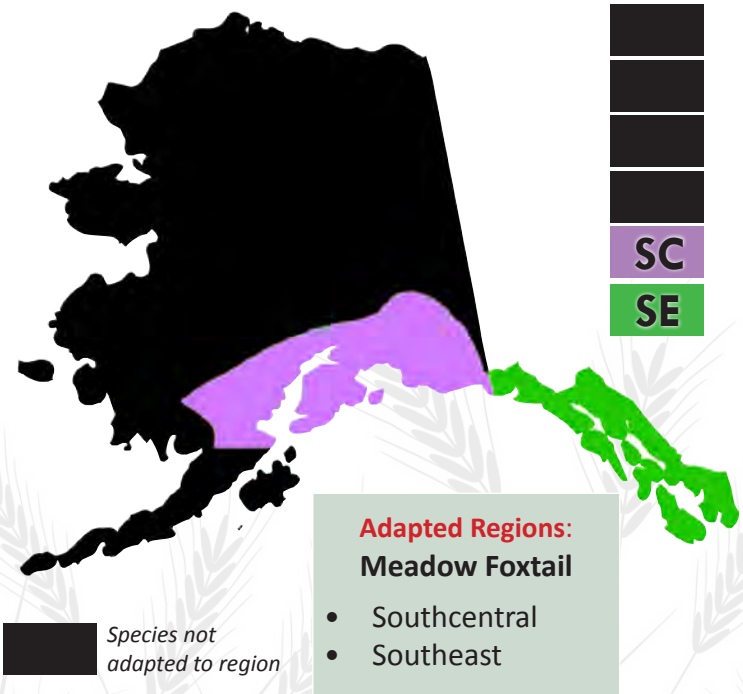
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	3	2

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Bunch	12 - 20 in.	Introduced	Good	Good	Excellent	Strong	5.8 - 8.0

POLARGRASS

Polargrass, Arctagrostis latifolia

Polargrass

Arctagrostis latifolia (L.)

Description

Arctagrostis latifolia (Polargrass) is a long lived, cool season, perennial, sod forming grass. It grows erect culms 45 to 60 centimeters (18 to 24 inches) tall. Polargrass leaves vary in length from a few inches to a foot and are usually 6 to 13 mm ($^1/_4$ - $^1/_2$ inch) wide. Inflorescence (seed-head) is narrow to somewhat open panicle 8 to 28 cm (3 to 11 inches) in length. Polargrass has low seedling vigor and produces a small seed with about 1,800,000 seeds per pound of seed.

Uses

Livestock: Polargrass can be used for pasture, hay, or silage. This grass is capable of generating high yields and can provide livestock with adequate forage and nutrition.

Wildlife: Polargrass has shown to provide good forage for caribou and reindeer in northern regions throughout Canada and Alaska. Grizzly bears have been observed grazing large quantities of polargrass during spring and summer months. It also provides cover and forage for small mammals and various song birds.

Forage Value

Polargrass produces large amounts of protein and is a high quality forage for large grazing animals. It possesses good nutritional value and digestibility similar to that of Timothy (*Phleum pratense*). Browsers such as moose and deer do not find Polargrass to be as palatable as grazing animals like cattle, bison and elk. As with most grasses, the nutritional value of Polargrass diminishes substantially after seed development or without adequate moisture.

Distribution and Adaptation

Polargrass is adapted to cool, wet climates, and is found growing along rivers, meadows, tundra, fresh water marshes, and inland levees. It is adapted to cold boggy soils and/or mesic up lands. This grass will grow well in soils with a pH ranging from 4.9 to 6.8. Polargrass is intolerant to droughty and/or saline environments. It prefers northern latitudes and can be found growing in portions of Greenland, Canada, and Alaska.

Culture

Polargrass seed should be planted ¼ to ½ inch deep. Low seedling vigor can make this grass difficult to establish. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate when broadcasting Polargrass is 8 lbs/acre and 5 lbs/acre when drill seeding. Seeding Polargrass as part of a mix is not recommended because of the grass's weak ability to compete with other plants. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary. Irrigation in combination with fertilization should increase overall yields.

Management

Polargrass seedling vigor is poor and early growth rates are usually slow. It requires an environment with low competition, moderate moisture, and adequate nutrients. However, once Polargrass is established, it has early and vigorous spring growth. Production trials of unfertilized vs. fertilized Polargrass have shown the differences in yield to be insignificant, suggesting that Polargrass does not respond well to commercial fertilizers. More research needs to be conducted to validate this theory, however.

Polargrass requires moderate amounts of moisture and should be irrigated when applicable. *Arctagrostis latifolia* is an extremely winter hardy grass, with a greater tolerance to winter ponding and icy conditions than other forage grasses like Timothy (*Phleum pratense*) and Smooth Brome (*Bromus inermis*).

Photo: USDA Natural Resource Conservation Service

A field of Polargrass, Arctagrostis latifolia

Cultivars and Releases

- '**Kenai**' - *University of Alaska Fairbanks release.*

  A W I SW SC SE

- '**Alyeska**' - *University of Alaska Fairbanks release.*

  A W I SW SC SE

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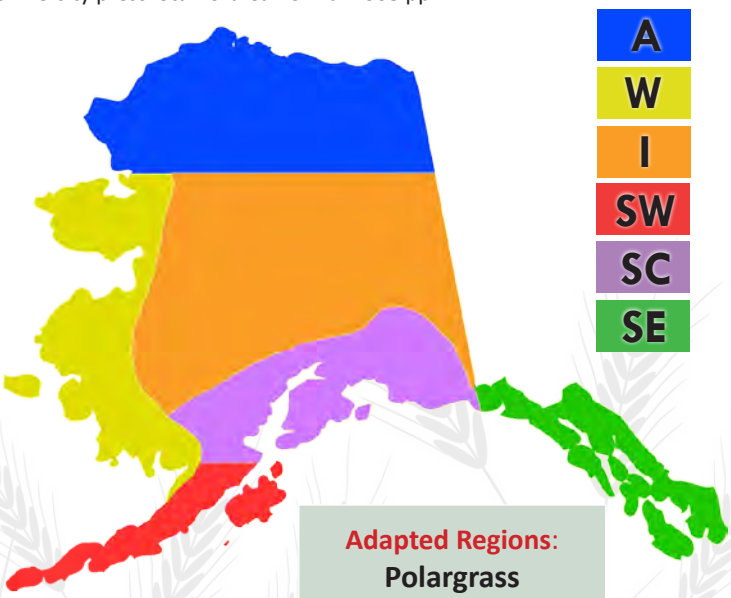

Adapted Regions:
Polargrass

- All Regions

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Sod	24 in.	Native	Poor	Good	Excellent	Poor	4.9 - 6.8

RED FESCUE


Photo: Brennan Veith Low, AK PMC

Red Fescue is a winter-hardy grass, adapted for use across Alaska.

Red Fescue

Festuca rubra (L.)

Description

Festuca rubra (Red Fescue) is a cool season, introduced, sod-forming grass. Leaves of Red Fescue are bright green, wiry, and narrow. They are pressed together in a "V" shape and appear nearly round. Sheaths reddish or purplish at base, culms sometimes bent and growing to about 35 - 46 centimeters (14 - 18 inches) tall. The inflorescence (seed-head) is a contracted and/or narrow panicle. Red Fescue produces about 410,000 seeds per pound of seed.

Uses

Livestock: Red Fescue is used for hay, pasture land, or silage. It is also utilized by cattle and horses. In some cases, Red Fescue will make up 10-15% of domestic sheep diets.

Wildlife: Red Fescue is consumed by deer, moose, elk and a variety of other wild ungulates. It is also great forage for upland game birds and various species of water fowl such as the lesser Canada goose.

Forage Value

The forage value of Red Fescue ranges from fair to good, depending on geographic location. It possesses fair nutritional value, even after freeze-up, until snow becomes too deep for grazing. Red Fescue is also known to retain high protein values throughout its growth stage.

Distribution and Adaptation

Red Fescue is hardy, wear-resistant, and shade tolerant. This grass is adapted to wet, acidic environments. It prefers well drained soils with a pH between 5 and 7.5, but requires ample moisture to become established. Red Fescue is adapted to cooler zones.

In areas of high temperatures and humidity, Red Fescue may turn brown or deteriorate during the summer months. This grass will generally recover in the fall when temperature and moisture conditions are more favorable. Red Fescue is highly competitive and is found all over North America.

Culture

When planting Red Fescue, seed should be planted ¼ to ½ inch deep. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting Red Fescue is 12 lbs/acre and 6 lbs/acre when drill seeding. Seeding rate calculations are based on Pure Live Seed (PLS), as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Fertilization, combined with irrigation, may increase overall yields.

Management

One should be aware of Red Fescue's aggressiveness and ability to out-compete other plants. It is not uncommon for Red Fescue to dominate a growing site even when planted in a mix with other grass species. This should be considered when formulating a forage seeding mix. Red Fescue can also be used to prevent the invasion of alders and willows.

References

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Photo: Alaska PMC

A field of Red Fescue in southcentral Alaska

Varieties and Releases

- '**Arctared**' - *University of Alaska Fairbanks release.*

  A W I SW SC SE

- '**Boreal**' - *Alberta, Canada release.*

  [redacted] W I SW SC SE

- '**Pennlawn**' - *Pennsylvania release.*

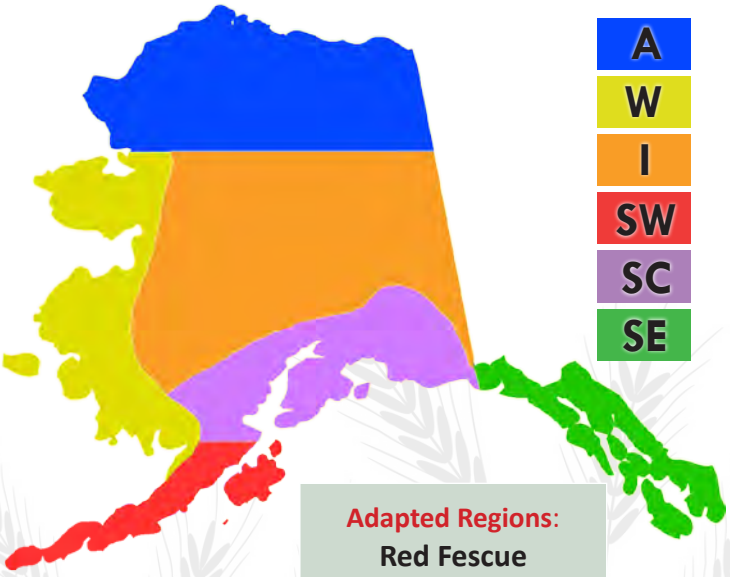
  [redacted] [redacted] [redacted] SW SC SE

- **Henderson Ridge** selected class germplasm; *- Alaska PMC release.*

  [redacted] [redacted] [redacted] SW SC [redacted]

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	2	3	3	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



[redacted] *Species not adapted to region*

Adapted Regions:
Red Fescue

- All Regions

see variety detail at left

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor - Good	Sod	14 - 18 in.	Introduced	Poor	Good	Good	Strong	5 - 7.5

SIBERIAN WILDRYE


Photo: Casey Dinkel, AK PMC

Siberian Wildrye seedhead

Siberian Wildrye

Elymus sibiricus (L.)

Description

Elymus sibiricus (Siberian Wildrye) is a tall growing, erect perennial bunchgrass, that grows from 75 - 90 centimeters (30 to 36 inches) in height. It is a cool season species native to fragmented intermountain areas. Siberian Wildrye can be easily identified by its long, lax, drooping seedhead. This grass species produces an abundance of seed, and has a conspicuous ability to grow in open, unshaded and infertile sites. Siberian Wildrye is known for its extreme winter hardiness and excellent seedling vigor. It produces approximately 127,000 seeds per pound of seed.

Uses

Livestock: Siberian Wildrye can be utilized as hay or as a pasture crop. It is used by cattle, horses, and sheep. The palatability of Siberian Wildrye is moderate to low for most classes of livestock.

Wildlife: A large variety of wildlife utilize Siberian Wildyre for cover. Most wildlife will not typically utilize this grass for feed as often as domestic livestock. Siberian Wildrye has low palatability for elk, bison and various species of waterfowl.

Forage Value

Siberian Wildrye has marginal forage quality. This grass also has poor digestibility due to large amounts of lignin, cellulose and hemicellulose. It has a protein content similar to Polar Brome (*Bromus inermis*), Slender Wheatgrass (*Elymus trachycaulus*), and Timothy (*Phleum pratense*), after the first year of establishment. Like most forage grasses, Siberian Wildrye nutrient levels are highest just before the plant develops its seedhead. There is limited Siberian Wildrye research data available concerning actual nutritional value, palatability, and grazing utilization.

Distribution and Adaptation

Siberian Wildrye is distributed across Europe, Asia, Russia, and parts of Canada and Alaska. It can be found growing in sandy soils, in areas receiving between 24 and 55 inches of annual precipitation. Siberian Wildrye is a very drought tolerant species and will not grow well in wet areas or areas with poorly drained soils. The grass is adapted to slightly acid to neutral soils, with a pH range from 5.0 to 7.2. Siberian Wildrye will not tolerate saline soils or shaded environments.

Culture

An average broadcast seeding rate for Siberian Wildrye is 12 lbs/acre. A rate of 6 lbs/acre should be used when drill seeding or when seeded in a mixture. Siberian Wildrye seeds should be planted at a depth of $^{1}/_{4}$ in. to 1 in. Seed should be planted in medium to coarse textured, well drained soil if possible. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Little information is available regarding the effect fertilizer and irrigation may have on Siberian Wildrye yields.

Management

Siberian Wildrye appears to be a good forage species, although more research is needed to determine its overall value. There are several potential problems for growers dealing with Siberian Wildrye. This grass possesses a needle like appendage or awn that could potentially be harmful to livestock. Siberian Wildrye should not be grazed within the first year of its planting. Grazing could potentially destroy or diminish its life span. During its first year of growth, Siberian Wildrye does not produce a high overall yield. There has been little research into pests (such as insects, mildews, or rust) that could be harmful to Siberian Wildrye.

Photo: Casey Dinkel, AK PMC

A field of Siberian Wildrye in southcentral Alaska.

Cultivars and Releases

- *There are no commercial Siberian Wildrye cultivars or releases currently available.*

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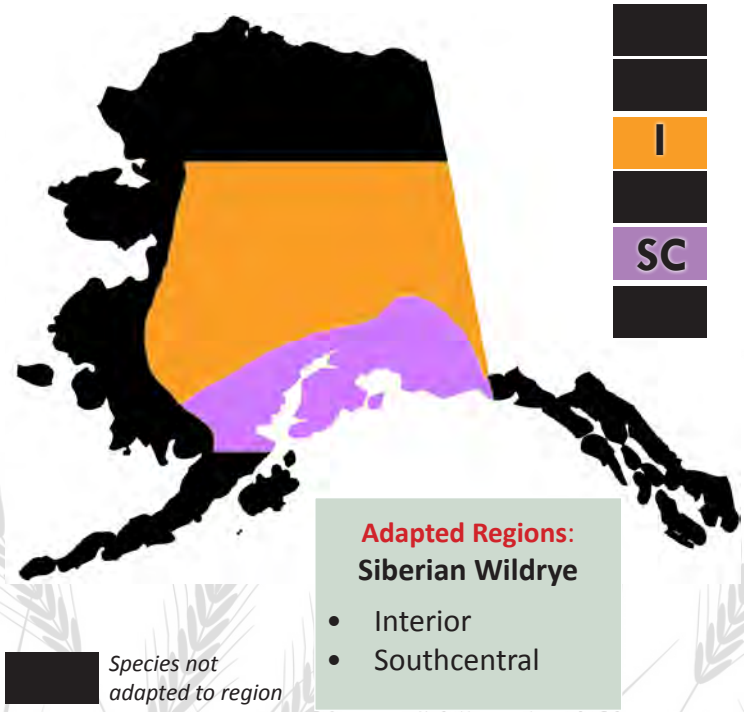
Klebesadel, L.J. (1993) Winterhardiness and Agronomic Performance of Wildryes Compared with Other Grasses In Alaska, and the Responses of Siberian Wildrye to Management Practices. Agricultural and Forestry Experiment Station, University of Alaska. Palmer, Alaska. 19 pp.

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	2	2	1	0

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Bunch	36 in.	Disputed	Poor	Good	Poor	Moderate	5.0 - 7.2

SLENDER WHEATGRASS

Photo: Brennan Veith Low, AK PMC

Slender Wheatgrass seed head

Slender Wheatgrass

Elymus trachycaulus (L.)

Description

Elymus trachycaulus (Slender Wheatgrass) is an erect, tufted bunchgrass ranging in height from 60 to 70 centimeters (24 to 30 inches). It is a cool season, perennial species native to the mountain and intermountain areas of the western United States and the northern Great Plains. Slender Wheatgrass has very short rhizomes and the seedstalks and stems have characteristic reddish to purplish tinge at the base. It is seldom found in pure stands and is relatively short lived with a life expectancy of only 4-6 years. Slender Wheatgrass has about 133,000 seeds per pound of seed.

Uses

Livestock: Slender Wheatgrass can be used for hay or pasture land. It's highly palatable to cattle and sheep, and provides good quality animal fodder.

Wildlife: Slender Wheatgrass is utilized by buffalo, elk, moose, mountain goat and dall sheep throughout Alaska. It is also used as forage and cover for some songbirds, upland game birds, small mammals, and waterfowl.

Forage Value

Slender Wheatgrass is valuable forage for most classes of livestock and wildlife. It is generally considered to have a good energy value and high protein content compared to other grasses. Slender Wheatgrass produces good quality hay if managed properly.

Distribution and Adaptation

Slender Wheatgrass is widely distributed across North America. Its range extends from Alaska to Newfoundland and south to North Carolina, Kentucky, Arkansas, Texas, and western Mexico. Slender Wheatgrass has been found growing at elevations from 4,500 to 12,000 feet. It prefers loams to sandy loams in areas receiving at least 14 inches of annual precipitation. Slender Wheatgrass is a drought tolerant species, but may still succumb to drought, since it sometimes matures later in the fall. The grass is adapted to slightly acid to slightly alkaline soils, growing in soils with a pH ranging from 5.6 to 9.0. Considerable genetic variability is present in Slender Wheatgrass populations, and some ecotypes may be rather specific to their original sites.

Culture

An average broadcast seeding rate for Slender Wheatgrass is 10 lbs/acre, or 5 lbs/acre used when drill seeded or included in mixtures. Seeding depth should be $^{1}/_{4}$ to $^{3}/_{4}$ inch. Seed should be planted in fine to medium textured well drained soil if possible. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures containing Slender Wheatgrass should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Slender Wheatgrass is best suited as a filler seed in mixtures containing slower establishing, longer lived grass species. It performs well when grown in combination with legumes. Slender Wheatgrass is moderately tolerant to grazing pressure, and requires good management to maintain stands. It is also considered to be a decreaser species on over grazed rangelands.

When choosing Slender Wheatgrass as forage in Alaska, one should highly consider planting a cultivar or release that is adapted to the climate in which the plants will become established.

Photo: Casey Dinkel, AK PMC

Slender Wheatgrass is an excellent drought-tolerant forage crop.

Cultivars and Releases

- **Wainwright** selected class germplasm;
  - Alaska PMC release.

  W I SW SC

- **'Revenue'** *- Canada release.*

  W I SW SC

- **'Primar'** *- released from Oregon and Washington.*

  W I SW SC

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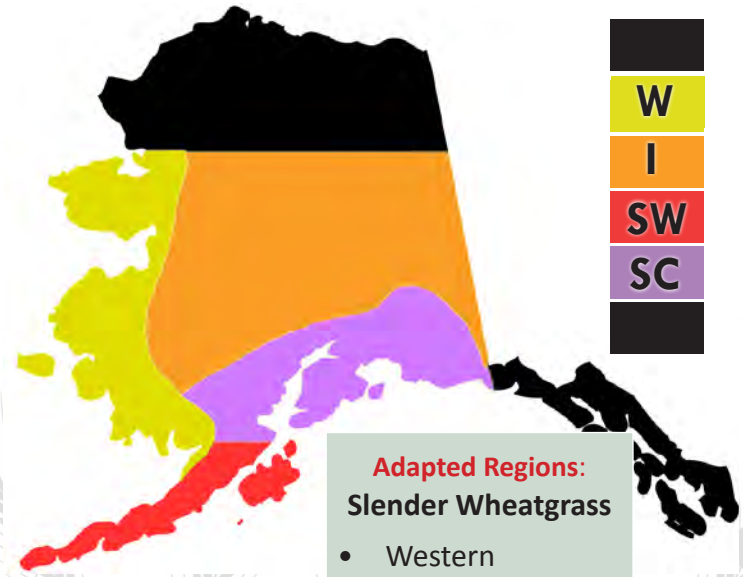
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	0

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Adapted Regions:
Slender Wheatgrass

- Western
- Interior
- Southwest
- Southcentral

Species not adapted to region

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	24 - 30 in.	Native	Excellent	Excellent	Good	Strong	5.6 - 9

SMOOTH BROME


Photo: Casey Dinkel, AK PMC

Smooth Brome is resistant to drought and temperature extremes.

Smooth Brome

Bromus inermis (L.)

Description

Bromus inermis (Smooth Brome) is a sod-forming perennial cool season grass that spreads by rhizomes. Culms vary from 30 to 45 centimeters (12 to 18 inches) in height on average. This plant produces numerous basal and stem leaves that vary in length from 10 to 25 cm (4 to 10 inches). Frequently, Smooth Brome leaves are marked by a transverse wrinkle resembling a "W" a short distance below the leaf tip. The inflorescence develops a characteristic rich purplish-brown color when mature. Brome seed is produced in semi-compact, 127 mm (5 inch) long panicles with ascending branches. The flat compressed seed is usually awnless, about 8.5 mm ($^1/_3$ inch) long, and smooth. Smooth Brome is the most widely used of the cultivated brome grasses. It produces approximately 142,000 seeds per pound of seed.

Uses

Livestock: Smooth Brome is used for hay, pasture, and/or silage. Cattle, sheep and horses find this grass highly palatable during the early growth stage, as well as late in the year after fall green-up.

Wildlife: Smooth Brome is used by wildlife to varying degrees, depending upon the quality of the grass and the animal species. Elk and Bison use it as winter forage. Upland game birds and waterfowl use Smooth Brome for nesting cover and rearing their brood. Rodents such as voles and shrews use it for food and cover throughout the year.

Forage Value

If grazed before flowering, Smooth Brome is high in protein with relatively low crude-fiber content. Forage value decreases rapidly with maturity, once seed is produced. Northern varieties of Smooth Brome produce less forage on average than southern varieties, but are just as palatable for livestock and wildlife.

Distribution and Adaptation

Smooth Brome is adapted to cool climates. It is resistant to drought and extremes in temperature. It is a long lived grass, living 5 to 7 years on average, but can live as long as 10 years or more. This plant is very susceptible to disease in areas of high humidity. Smooth Brome grows best on well drained silt and clay loam soils with high fertility. It will also grow well on lighter textured soils where adequate moisture and fertility are maintained. Smooth Brome performs best in a slightly acid to slightly alkaline environment (pH range of 6.0 to 7.5). Stands are difficult to obtain and growth is poor on soils high in soluble salts.

Smooth Brome's range of distribution is centered within the corn belt of North America and includes portions of Canada and Alaska. Depending on variety, this grass can grow in several regions of Alaska, as far north as Fairbanks.

Culture

Due to slow rates of germination and establishment, Smooth Brome requires a clean, firm seedbed. An average seeding rate for broadcast seeding is 20-25 lbs/acre, 10-15 lbs/acre when drill seeding. If seeded as part of a mixture, 5-10 lbs/acre should be used. When seeding in the fall, make sure to have seed in the ground at least six weeks prior to the first expected frost. Seedings should be drilled at a depth of $^1/_2$ to $^3/_4$ inch. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios for Smooth Brome depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation, in combination with fertilization, should increase overall yields.

Management

Smooth Brome requires heavy applications of nitrogen in early spring and in fall to maintain high yields in a pure stand. Optimum forage production is obtained when brome is used in a planned cropping system and plowed out after 3 to 4 years. Smooth Brome's heavy sod makes it an excellent soil-conditioning crop, when included in cropping systems. In deep, well-drained soils it will root to 4 feet. Smooth Brome performs best in grassed waterways, field borders, and other conservation uses, where the forage can be cut and removed while in early bloom.

Pastures should not be grazed prior to attaining a minimum height of about 10 inches at the beginning of the grazing season. Grazing pressures should be adjusted throughout the season to avoid grazing this grass below a minimum height of 4 inches.

Grasshoppers and seed blight can be a factor during grass establishment, in semi-humid areas. Foliar diseases in humid areas have also been known to cause serious problems. Smooth Brome can be dramatically affected by seed midges, such as *Stenodiplosis bromicola*, in some northern areas.

Cultivars and Releases

- '**Carlton**' - *Western Canada release.*

  I SC

- '**Manchar**' - *Washington release.*

  I SC

- **'Polar' -** *Alaska developed 'Polar' Brome may become commercially available in the future. Check with the Alaska Plant Materials Center for further detail.*

References

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Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	3	3	3	2

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Photo: Alaska PMC

Smooth brome, Bromus inermis

Klebesadel, L.J. (1992) Bromegrass in Alaska. I. Winter Survival and Forage Productivity of Bromus Species, Types, and Cultivars as Related to Latitudinal Adaptation, University of Alaska Fairbanks, School of Agriculture and Land Resources Management, Bulletin 87, 13 pp

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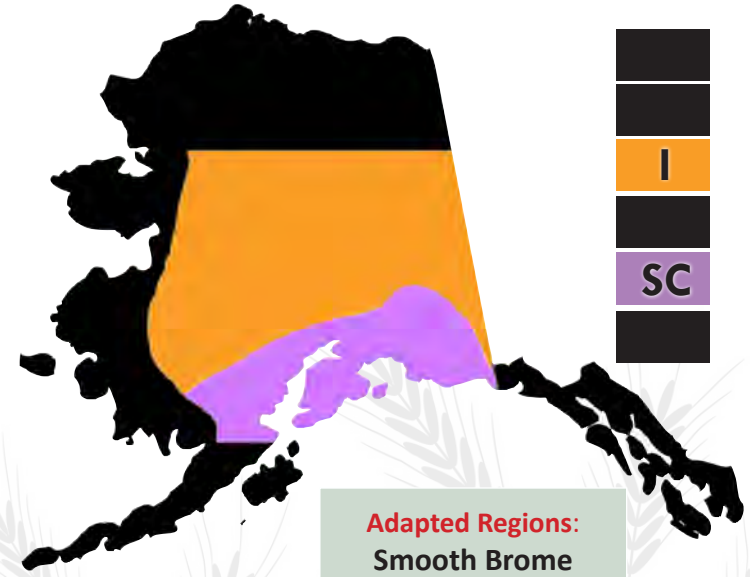

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Sod	12 - 18 in.	Introduced	Poor	Good	Fair	Strong	6.0 - 7.5

SPIKE TRISETUM

Photo: Natural Resource Conservation Service (NRCS)

Spike Trisetum seed head

Spike Trisetum

Trisetum spicatum (L.)

Description

Trisetum spicatum (Spike Trisetum) is a relatively short-lived, cool-season perennial bunch grass. It grows erect culms 50 to 75 centimeters (20 to 30 inches) tall. Leaves are usually flat to folded, and 2.5 to 13 cm (1 to 5 inches) in length. The inflorescence is also 2.5 to 13 cm (1 to 5 inches) long, narrow, dense, and sometimes purplish green. Spike Trisetum seed is small, with about 2,000,000 seeds per pound of seed. Spike Trisetum has a high root/shoot ratio in comparison with other grasses.

Uses

Livestock: Spike Trisetum is commonly used for pasture. It is considered highly palatable for all classes of livestock. When used for hay, Spike Trisetum provides nutritious forage for cattle, sheep, and horses.

Wildlife: Big game animals such as bison, elk, and deer, commonly utilize Spike Trisetum throughout its growing season. This grass is highly palatable to all classes of wildlife.

Forage Value

Spike Trisetum produces excellent quality forage for all classes of livestock and large wildlife, though it does not respond well to heavy grazing pressure. It is highly palatable to browse and grazing animals, and produces large amounts of protein in comparison to other grasses. Spike Trisetum has good digestibility and is considered to be an important grass for mountainous regions.

Distribution and Adaptation

Spike Trisetum is adapted to medium textured or well drained soils, and prefers a pH range of 4.9 to 7.5. It is found growing on drier areas of mountain meadows, roadsides, clear cuts, and is distributed almost worldwide. Spike Trisetum is tolerant of prolonged periods of drought or moisture, though it will not persist under conditions of high salinity.

Culture

Spike Trisetum seeds should be planted from ¼ to ½ inch deep. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcast seeding is 6 - 12 lbs/acre and 4 - 6 lbs/acre when drill seeding. When seeded in a mixture, apply at a rate of 2 - 4 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Spike Trisetum starts its growth in early spring. Like many grasses, its protein values diminish upon setting seed. Spike Trisetum does not respond well to heavy grazing pressure. Precaution should be taken not to over graze this grass. Spike Trisetum will stay green well into August or until covered by snow. It seldom occurs in dense stands, but usually cures well when cut for hay. Seed can be damaged more easily than most other grasses due to a liquid endosperm. Care should be taken when drill seeding to limit seed damage. At present, there are no known pests that are a concern for Spike Trisetum.

Photo: Casey Dinkel, AKPMC

A mature stand of Spike Trisetum

Cultivars and Releases

- **Nelchina** - selected class germplasm; *Alaska PMC release.*

W I SW SC SE

References

Wright, S.J. and P.K. Czapla (2010) Alaska Coastal Revegetation & Erosion Control Guide, State of Alaska, Division of Agriculture, Plant Materials Center, Anchorage, Alaska. 234 pp Link: http://dnr.alaska.gov/ag/akpmc/reveg/

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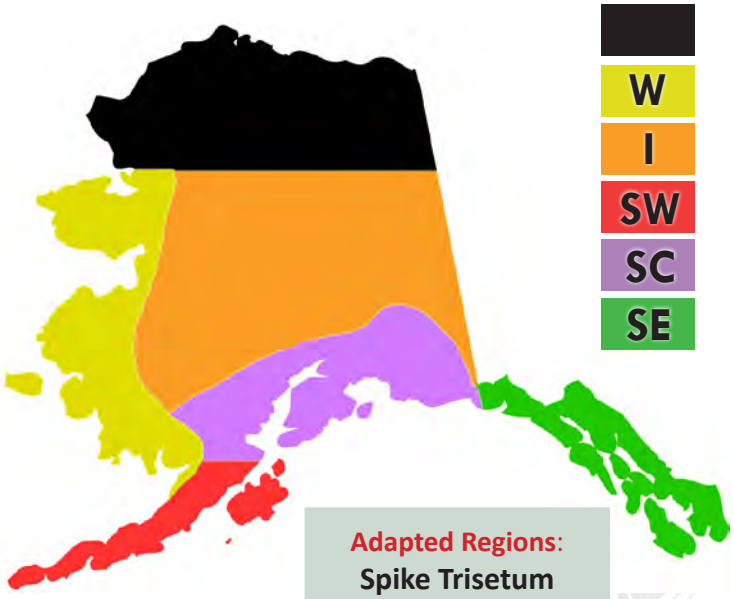
Stubbendieck, J., S.L. Hatch and L.M. Landholt (2003) A Field Guide, North American Wildland Plants. University of Nebraska, University of Nebraska press. Lincoln, Nebraska. 501 pp



Species not adapted to region

Adapted Regions:
Spike Trisetum

- Western
- Interior
- Southwest
- Southcentral
- Southeast

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Bunch	20 - 30 in.	Native	Poor	Good	Good	Strong	4.9 - 7.5

TIMOTHY

Timothy seed head

Timothy

Phleum pratense (L.)

Description

Phleum pratense, Timothy is a relatively short-lived, cool-season perennial bunch grass that grows in stools or clumps and has a shallow, compact, and fibrous root system. It grows in erect culms 50 to 100 centimeters (20 to 40 inches) tall. Leaves vary in length from 5 to 30 cm (2 to 12 inches) and are about ($^1/_4$ inch) wide, narrowing gently toward the tip. Heads spike-like and dense, from 5 to 15 cm (2 to 6 inches) in length. The seed is very small and usually remains enclosed within the glumes. Timothy produces approximately 1,230,000 seeds per pound of seed. Timothy is different from most other grasses in that 1, or occasionally 2, of the basal internodes of the stem swell into a bulb-like growth. This characteristic is often used to identify the plant during its early stages of growth.

Uses

Livestock: Timothy is used for pasture and silage, but mostly for hay. It is palatable and nutritious for cattle and sheep, and also makes excellent hay for horses. Timothy is considered good forage for cattle and horses during the spring, summer, and fall. When being grazed by sheep it is considered good forage during the summer and fair during the spring and fall.

Wildlife: Big game animals such as bison, elk and deer commonly utilize Timothy throughout its growing season. Some studies have shown that Timothy makes up to 20% of bison and elk diets. Small mammals, song birds, upland game birds and waterfowl will also use Timothy for nesting, brood rearing and escape cover.

Forage Value

Timothy produces good quality hay for most classes of livestock and wildlife. It also provides ample amounts of protein within the first 25 days of its growing cycle. Once Timothy is mature, crude protein values and digestibility diminishes greatly, a fact that should be considered when producing a hay crop. After the first hay cutting, Timothy can provide good late summer and early fall pasture forage.

Distribution and Adaptation

Timothy is adapted to a cool, humid climate. Timothy thrives in rich moist bottomlands and on finer textured soils, such as clay loams. It does not do well on coarser soils. Timothy prefers a pH of 5.5 to 7.0. Timothy will grow for a time on soils low in fertility, but it is better adapted to high fertile soil. It is not well adapted to wet, flat land where water stands for any considerable time, although it can withstand somewhat poorly-drained soils. Under conditions of limited moisture, Timothy performs poorly; it does not tolerate drought or prolonged high temperatures. Timothy is distributed throughout the entire United States.

Culture

When planting Timothy, seeds should be planted a ½ inch deep in moist soil, and ¾ inch in dry or coarse textured soils. It is commonly planted in mixtures with legumes or small grains. Seeding rates for Timothy depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 4-8 lbs/acre, and 2-4 lbs/acre when drill seeding. When Timothy is seeded in a mixture, apply at a rate of 4-6 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Timothy is highly responsive to fertilizers and should be fertilized frequently and in ample quantities. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Timothy makes a first rate companion grass for alfalfa, trefoil, or clover as it is the grass that competes least with legumes. Over 31 diseases have been reported as affecting Timothy; however, most of these are of little concern and can be controlled. Timothy is susceptible to stem rust disease which can cause loss of vigor and forage quality. Rust-resistant varieties have been developed to control this disease.

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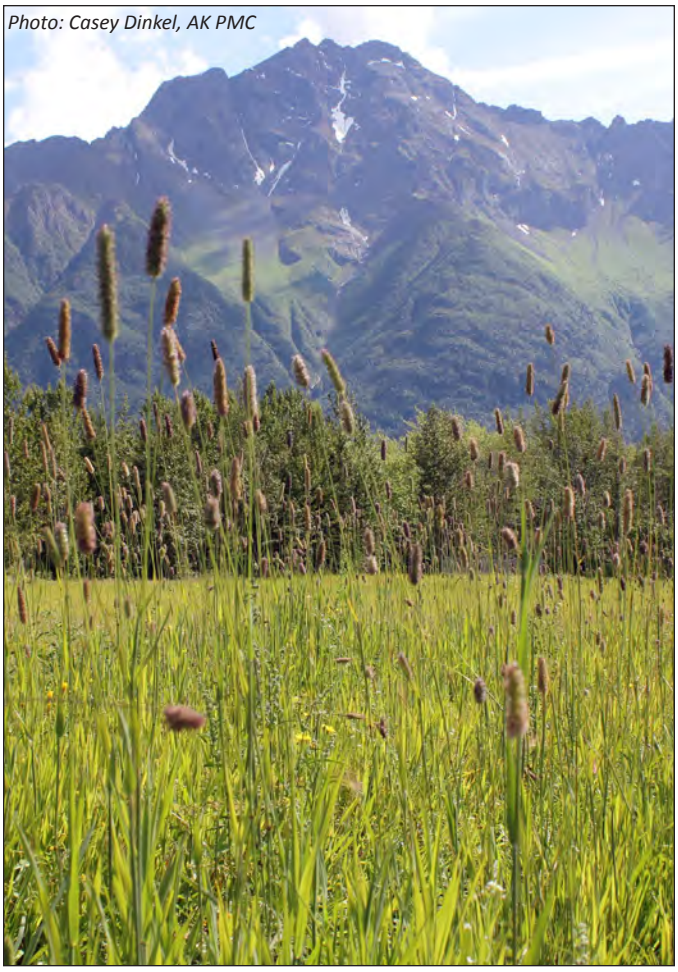
Photo: Casey Dinkel, AK PMC



A mature stand of Timothy, Phleum pratense

Cultivars and Releases

- **'Engmo'** - *Norway release.*

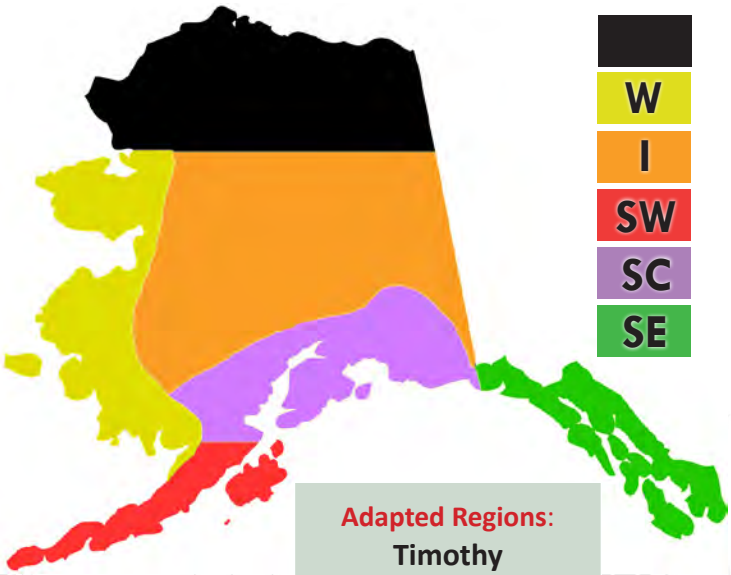
  W I SW SC SE

- **'Climax'** - *Canada release.*

  W I SW SC SE

- **'Champ'** - *Canada release.*

  W I SW SC SE



Adapted Regions:
Timothy

- Western
- Interior
- Southwest
- Southcentral
- Southeast

Species not adapted to region

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	3	2

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	30 in.	Introduced	Poor	Poor	Good	Moderate	5.5 - 7.0

TUFTED HAIRGRASS


Photo: Brennan Veith Low, AK PMC

Tufted Hairgrass is well suited for Alaskan environments.

Tufted Hairgrass

Deschampsia cespitosa (L.)

Description

Deschampsia cespitosa (Tufted Hairgrass) is a highly variable, perennial cool season grass species that grows from 51 to 61 centimeters (20 - 24 inches) tall. Stems are erect, and the leaves are between 1.5 and 4 mm (.06 - .16 inches) wide, flat or rolled. The leaves are mostly basal in a dense tuft. Tufted Hairgrass's inflorescence is upright to nodding, loosely branched, open and 10 to 25 cm (4 to 10 inches) long. There are two florets (flowers) per spikelet. Flowering occurs from May to September. Tufted Hairgrass seeds mature from late June to late September, depending on location. Tufted hairgrass produces approximately 1,360,000 seeds per pound of seed.

Uses

Livestock: Tufted Hairgrass can be utilized as hay or as a pasture crop. It is used by cattle, horses, and sheep. The palatability of Tufted Hairgrass is high to moderate for most livestock.

Wildlife: A large variety of wildlife utilizes Tufted Hairgrass as forage and/or cover. However, most wildlife will not utilize Tufted Hairgrass as often as domestic livestock. The species has moderate to low palatability for elk, bison, bear and various species of waterfowl.

Forage Value

Tufted Hairgrass produces good quality hay for most classes of livestock and wildlife. It also provides ample amounts of protein depending on its growing stage. Tufted Hairgrass can provide good summer pasture forage for livestock. Although forage value is usually moderate to high, Tufted Hairgrass consist of only 1-3% of wild animal diets.

Distribution and Adaptation

Populations of Tufted Hairgrass occupy sunny to partially shaded environments that are moderately moist to seasonally flooded. The species grows in a wide variety of soils; fine to coarse, mesic to hydric soil types. Tufted Hairgrass is adapted to a pH range from 4.8 to 7.5. Some populations have extreme tolerance to heavy metals and high soil acidity. The salinity tolerance of Tufted Hairgrass is generally low, but plants growing in coastal estuaries may be slightly more salt tolerant.

Tufted Hairgrass crowns typically survive all but the most severe (hottest) fires. One of the most widely distributed grasses on earth, Tufted Hairgrass is found in arctic and temperate regions. It occurs from sea level to elevations of up to 14,000 ft. Tufted Hairgrass habitat includes coastal terraces, upper tidal marshes, seasonally wet prairies, moist subalpine mountain meadows, open forests, and alpine areas above timberline.

Culture

When planting Tufted Hairgrass, seed should be planted ¼ to ½ inch deep. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate for broadcasting is 12 lbs/acre and 6 lbs/acre when drill seeding. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied.

Management

Tufted Hairgrass is adapted to northern regions and is well suited for Alaskan environments. One should be aware of Tufted hairgrass's aggressive growth characteristics; it tends to compete with other grass species. A number of diseases are associated with Tufted Hairgrass, including ergot, stripe smut, blind seed and other turf diseases. Hairgrass is also vulnerable to several rusts and leaf spots. Insect pests such as aphids, billbugs, and leafhoppers can threaten stands of Tufted Hairgrass, and should be monitored.

Photo: Casey Dinkel, AK PMC

Tufted Hairgrass, Deschampsia cespitosa

Cultivars and Releases

- **'Nortran'** - *University of Alaska Fairbanks release.*

W I SW SC SE

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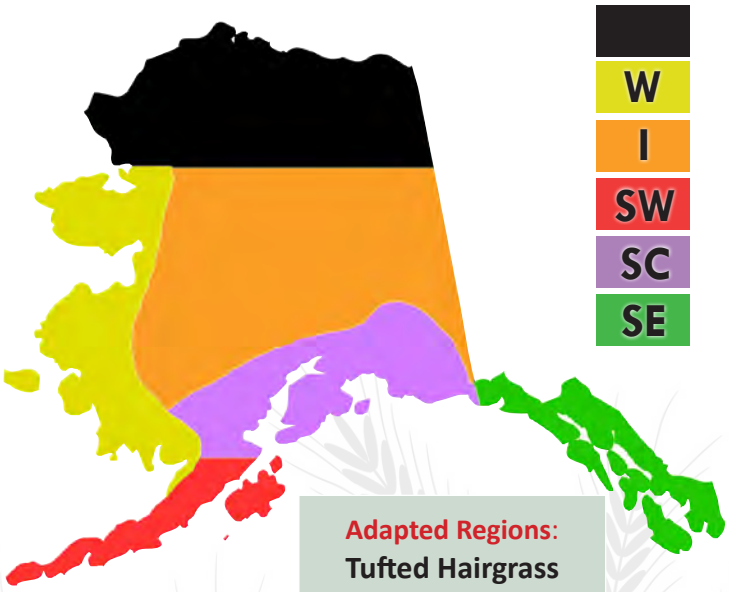
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	1	3	3	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Species not adapted to region

Adapted Regions:
Tufted Hairgrass

- Western
- Interior
- Southwest
- Southcentral
- Southeast

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	20 - 24 in.	Native	Poor	Good	Good	Strong	4.8 - 7.5

Cereal Grains

Photo: Brennan Veith Low,AK PMC

Barley, *Hordeum vulgare*

Barley, *Hordeum vulgare*

Common Oat, *Avena sativa*

BARLEY (Cereal)

Barley seedhead

Barley

Hordeum vulgare (L.)

Description

Hordeum vulgare (Barley) is an erect annual bunch grass that can reach a height of 90 centimeters (36 inches) depending on the variety. This small grain can be intercropped with legumes, such as Field Pea, to increase forage nutrients and palatability. Properly managed, legumes provide needed nitrogen for grasses and protein for livestock. Stems of Barley are hollow, smooth, and glabrous (shiny). Some varieties are susceptible to lodging. Barley leaves are typically 13 - 19 mm (½ to ¾ of an inch) wide and roughly 30 cm (12 inches) in length. Barley spikelet's exhibit short or long, narrow, and scabrous (rough) awns that can be problematic when fed to livestock. It produces a large spindle shaped seed with high seedling vigor. Barley plants produce roughly 13,000 seeds per pound of seed.

Uses

Livestock: Barley is commonly produced for grain fodder, but is sometimes fed directly as "green cut" when intercropped with a legume such as peas. This small cereal grain produces excellent forage and is highly palatable to all classes of livestock. In addition, Barley produces excellent straw, generally used by dog mushers for bedding.

Wildlife: Barley makes excellent fodder for large ungulate wildlife, such as moose, elk and bison. It also provides feed and cover for upland game birds, small mammals, waterfowl and various song birds.

Forage Value

Barley is considered highly palatable and excellent forage for most classes of livestock and wildlife. On average this small grain produces 12% protein when grown in monoculture. Total forage protein levels should increase if Barley is intercropped with Field Pea. Nutritional levels will vary depending on climate, location, and other agronomic inputs such as fertilizers, irrigation, and harvest time.

Distribution and Adaptation

Barley can be found growing throughout much of the world including Alaska, Canada, and the contiguous United States. It is adapted to medium textured soils and prefers a pH ranging from 5.3 to 8.5. Barley is moderately tolerant of droughty and/or wet conditions but does not persist well in shady environments. It is highly tolerant of saline soil conditions.

Culture

Barley grows well in cool moist climates and should be planted ½ to 1½ inches deep. A firm seedbed is essential in providing good seed to soil contact. This will provide a more reliable water supply and prevent large air pockets in the soil that are less than ideal for seedlings to establish.

Barley is typically drill seeded at a rate of 70 to 100 lbs/acre depending upon soil type, moisture, and location. When seeded with a legume, seeding rates should be reduced by about half and growth cycles must be synchronized. Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before seeding. Irrigation in combination with fertilization should increase field productivity.

Management

Barley is an excellent grain and forage crop if properly managed. Barley is well adapted to Alaska's long day length and short growing season. Several barley cultivars have been specifically developed to survive Alaska's harsh climate, while producing higher nutritional grain and forage values. The cultivar '*Weal*' is an awnless Barley that was developed as a dual purpose grain and/or forage.

Barley requires adequate moisture and responds well to nitrogen fertilizer. When planting Barley with legume species nitrogen should not be over applied due to the adverse affects it can have on nitrogen fixing plants. Lodging can also be problematic with some Barley cultivars; one should conduct ample research about their selected cultivar before planting. Currently, producers are evaluating the costs and benefits of irrigation on the production of Barley and other cereal grains throughout Alaska.

Barley is susceptible to powdery mildew (*Blumeria graminis*), leaf scald (*Rhynchosporium secalis*), and barley rust, (*Puccinia hordei*), covered smut (*Ustilago hordei*), loose smut (*Ustilago nuda*) and ergot (*Claviceps purpurea*). To date, these Barley diseases have not been found in Alaska. Therefore, cultivars developed for Alaska do not have a strong resistance to disease. Before planting, many farmers treat seed to prevent ergot and smut. Managers should also rotate crops and select disease free seed when applicable.

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Cultivars and Releases

- **'Otal'** - *University of Alaska Fairbanks release.*
- **'Datal'** - *University of Alaska Fairbanks release.*
- **'Albright'** - *Canada release.*

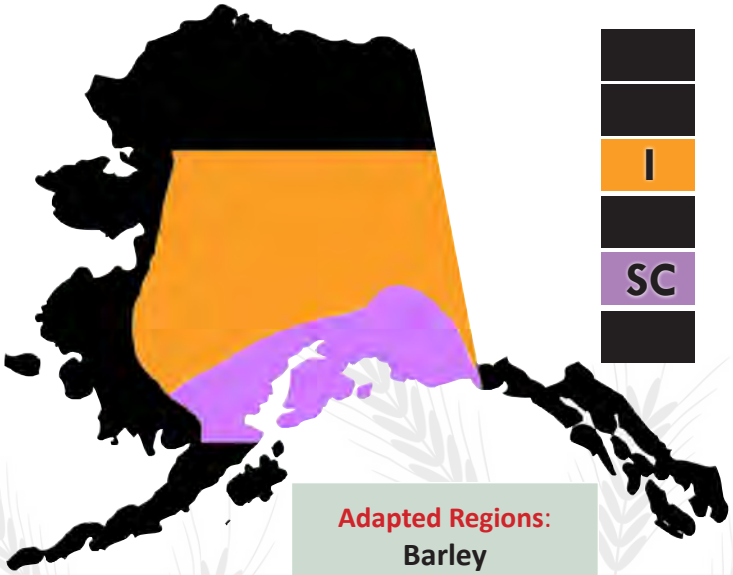
- **'Thual'** *(hulless)* - *Univ. of Alaska Fairbanks release.*
- **'Weal'** *(awnless)* - *Univ. of Alaska Fairbanks release.*

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Photo: Powell Gardens, Kansas City's Botanical Garden (powellgardens.org)

Barley, Hordeum vulgare



Adapted Regions:
Barley

- Interior
- Southcentral

see variety detail at left

Species not adapted to region

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	24 in.	Introduced	Good	Good	Good	Moderate	5.3 - 8.5

COMMON OAT (Cereal)

Photo: Henrik Reinholdson (Wikimedia.org)

Common Oat, Avena sativa

Common Oat

Avena sativa (L.)

Description

Avena sativa, Common Oat is an erect growing annual bunch grass that produces a fibrous root system. This small grain can attain heights greater than 60 centimeters (24 inches), depending on variety. Oats are generally intercropped with various legumes such as clovers and/or field peas to increase forage nutrient levels. This also allows some legumes to use their tendrils to climb the stalks of standing grass. Leaves are non-auriculate and medium to dark green in color. *Avena sativa* produces a large, lance shaped seed with high seedling vigor. Oat plants typically produce 20,000 seeds per pound of seed, depending upon the variety.

Uses

Livestock: Oats are commonly used as a hay and silage crop, but can also be used for pasture. This small cereal grain makes excellent forage and is highly palatable to all classes of livestock. Early growth oat plants can be fed as "green cut" forage for livestock. In addition, oat straw makes excellent roughage.

Wildlife: Oats have excellent forage value for a large variety of wildlife such as bears, elk, bison and moose. They are also used for food and cover by upland game birds, waterfowl, small mammals and various song birds.

Forage Value

Oats are highly palatable and excellent forage to all classes of livestock and wildlife. The species produces moderate/high protein and carbohydrate levels. Oats can be fed as hay, silage, green cut, grain, and/or eaten directly on the pasture. Nutritional levels will vary depending upon the selected form that oats are fed as well as how other agronomic inputs (fertilizer, irrigation, harvest time) are managed and applied. Oat hay generally contains 10 to 15 % protein and is typically intercropped with a legume such as peas for added nutrition.

Distribution and Adaptation

Oats can be found growing throughout much of the world including Alaska, Canada, and the contiguous United States. It is adapted to fine to coarse textured soils, and prefers a soil pH between 5.3 - 8.5. Oats are moderately tolerant of saline soils and droughty conditions. However, this small grain prefers adequate moisture and will not tolerate shady growing environments.

Culture

Oats are best adapted to cool moist climates and should be planted 1½ to 2 inches deep. A firm seed bed allowing good seed to soil contact is essential. Soil samples should be collected and analyzed before seeding. Oats are generally drill seeded at a rate of 50 to 90 lbs/acre. Seeded with a legume, seeding rates should be reduced by about half, and growth cycles should be synchronized. Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Irrigation in combination with fertilization should increase field productivity.

Management

Oats make an excellent forage crop when properly managed. This small grain is well adapted to Alaska's long days and short growing season in the summer. Oats are better adapted to lower pH soils than Barley or Wheat. Oat will complement various legumes when intercropped, and the species makes a high protein and carbohydrate fodder. When planting oats with a legume species, nitrogen should not be over applied due to the adverse affects it can have on nitrogen fixing plants.

Common Oat (*Avena sativa* L.) is the species most used in in Alaska, although other species such as Black Oat (*Avena strigosa* L.), Red Oat (*Avena byzantina* C. Koch), and Hulless Oat (*Avena nuda* L.) are also successfully grown throughout the state. Oat straw does not contain long awns, making it more desirable than barley straw for use as animal bedding. Some oat varieties have difficulty with lodging - conduct research prior to planting.

Oat diseases have not been a significant problem in Alaska. Fungi such as scald (*Rhynchospoium secalis*), stripe (*Pyrenophora graminea*), net blotch (*Pyrenophora teres*), spot blotch (*Cochliobolus sativus*) and smuts (*Ustilago spp*.) have been known to occur. To help prevent disease outbreaks, managers should rotate crops in the field periodically and be prudent about selecting disease free seed.

Cultivars and Releases

- **'Toral'** - *University of Alaska release.*
- **'Nip'** - *Sweden release; Univ. of AK Fairbanks release.*
- **'Ceal'** - *University of Alaska release.*

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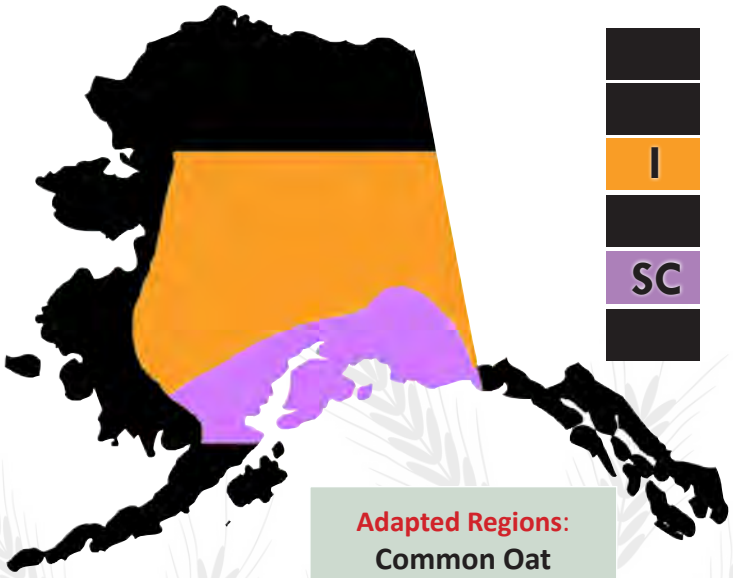
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Photo: H. Zell (Wikimedia.org)

Common Oat, Avena sativa



Adapted Regions:
Common Oat
- Interior
- Southcentral

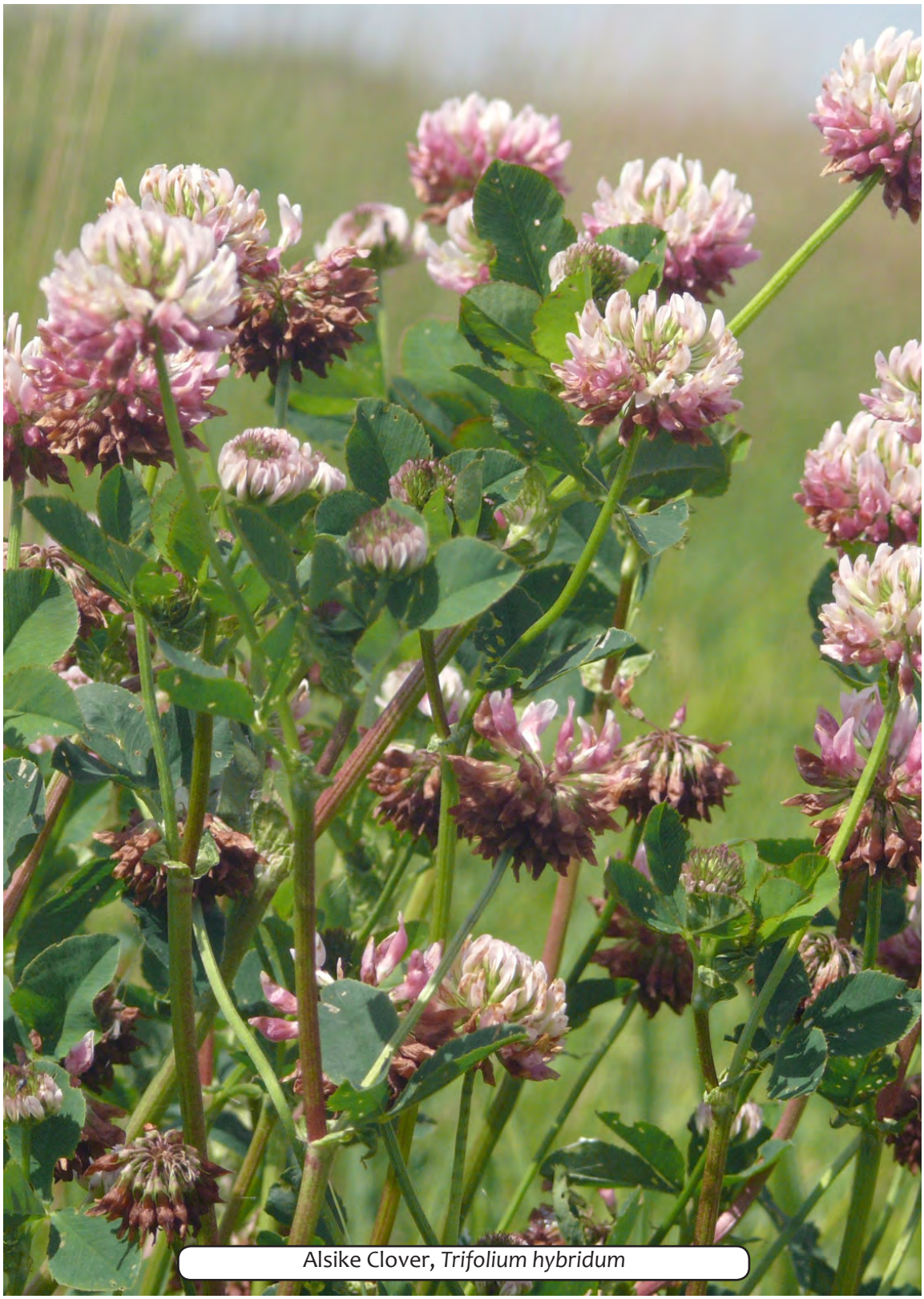
see variety detail at left

Species not adapted to region

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Bunch	24 in.	Introduced	Fair	Fair	Good	Moderate	5.3 - 8.5

Legumes

Photo: User BerndH (Wikimedia.org)



Alsike Clover, *Trifolium hybridum*

Alfalfa, *Medicago sativa*
Alsike Clover, *Trifolium hybridum*
Field Pea, *Pisum sativum*
Red Clover, *Trifolium pratense*
White Clover, *Trifolium repens*

ALFALFA

Photo: Sten Porse (Wikimedia.org)

Alfalfa

Medicago sativa (L.)

Description

Medicago sativa, Alfalfa is a long lived perennial legume. It grows erect culms, 76 - 91 centimeters (30 to 36 inches) in height, branching from a single base. Leaves alternate on the stem and are pinnately trifoliolate, while individual leaflets are obovate (ovalish) or lancolate (lance shaped). Alfalfa produces numerous flowers that are purplish to yellow and borne in loose racemes or clusters. Alfalfa grows a series of lateral roots, with a distinct tap root that may penetrate 6 to 9 meters (20 to 30 feet) below soil surface. This legume produces a small kidney shaped seed. Alfalfa produces 190,000 to 220,000 seeds per pound of seed, depending upon variety. Seedling vigor can be low to moderate, also depending upon the selected variety.

Uses

Livestock: Alfalfa is typically used for haying, silage, and pastures land. However, it can also be fed as haylage, wafers, pellets or dried meal. It is highly palatable to all classes of livestock, but caution is advised when feeding Alfalfa due to its high bloat hazard.

Wildlife: Alfalfa is highly palatable to a variety of large wildlife, such as deer, elk and bison. It is utilized as food and cover by small mammals, waterfowl and upland game birds. Canada geese, sandhill cranes, rough grouse and mallard ducks can be found utilizing Alfalfa.

Forage Value

Alfalfa produces large amounts of protein and is excellent quality forage for all classes of livestock and wildlife. This legume has the highest feed value of all commonly grown hay crops. Alfalfa is one of the most important forage plants in production agriculture; sometimes called the "*Queen of the Forages*". It is high in mineral content and possesses excellent nutritional value, containing at least 10 different vitamins.

Distribution and Adaptation

Alfalfa is adapted to a variety of climatic and soil conditions, and can be found growing throughout the United States and parts of Canada. Varieties such as 'Denali' have been hybridized to better withstand extreme Alaskan climates. Generally, Alfalfa prefers deep well drained medium textured soils, with a pH of 6 to 8.5. It is highly drought tolerant and can withstand saline soils. Alfalfa will not tolerate sites with frequent overflow or high water tables.

Culture

Alfalfa should be planted no deeper than a ¼ inch on fine textured soils and ½ inch deep on coarse soils. It should be drill seeded on a firm seed bed. Cultipacking the soil before and after planting Alfalfa is normally recommended. Seeding rates depend greatly upon soil type, moisture, and location. Note that Alfalfa can have trouble over-wintering and competing with perennial grasses.

An average seeding rate when broadcasting Alfalfa is 10 lbs/acre and 5 lbs/acre when drill seeding. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B. Appropriate fertilizer ratios depend upon soil type, chemistry and location. Research in Alaska has shown that the application of fertilizer produces no significant yield change. If applying fertilizer, collect and analyze soil samples first. Pastures and hay fields should be irrigated when necessary and/or applicable.

Management

Alfalfa makes an excellent pasture, hay or silage forage. Although this crop is usually harvested 2 years after planting, one should be aware that most varieties will not over-winter throughout Alaska. This can be attributed to several environmental factors such as acid soils, nutrient deprived soils, cold stress and damage to the plants root system. There are several varieties of Alfalfa that have been developed or hybridized to combat these factors.

Alfalfa will tolerate moderate pasture grazing, but stands will weaken if over grazed or grazed too often. When applicable, Alfalfa can be grown with a perennial grass species, such as

Photo: Wikimedia.org

Alfalfa, Medicago sativa

Smooth Brome (*Bromus inermis*). This can greatly reduce the danger of bloating in livestock when pasture grazing. Alfalfa is susceptible to many agricultural pests, including spotted or pea aphid, alfalfa weevil, stem nematode, bacterial wilt, snout beetle and several leaf spots.

Cultivars and Releases

- *Denali Alfalfa was developed by UAF, but is not commercially available as of mid 2012. Check with the Alaska Plant Materials Center for further information.*

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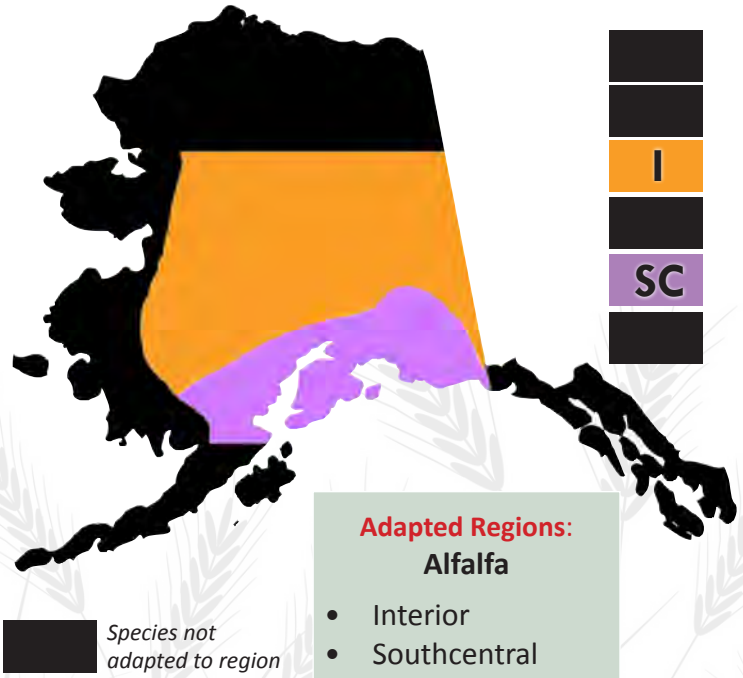
Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
1	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Upright crown	30 - 36 in.	Introduced	Excellent	Poor	Excellent	Strong	6 - 8.5

ALSIKE CLOVER

Photo: User Aiwok (Wikimedia.org)

Alsike Clover, Trifolium hybridum

Alsike Clover

Trifolium hybridum (L.)

Description

Trifolium hybridum, Alsike Clover is a short lived perennial and/or biennial legume that can reach 45 to 60 centimeters (18 to 24 inches) tall. It grows decumbent to erect vertically ridged culms. Leaves are palmately trifoliate with long petioles on the lower leaves and smaller or reduced petioles on the upper leaves. Individual leaflets are obovate (ovalish) or elliptic (narrow oval) with narrow tipped stipules. Alsike produces numerous flowers that are pink, red, and/or white and borne in leaf axils at the end of stems.

Alsike is similar to several other introduced *Trifolium* species that occur throughout Alaska, such as Golden Clover (*Trifolium aureum*), Lupine Clover (*T. lupinaster*), Red Clover (*T. pratense*), White Clover (*T. repens*), and Field Clover (*T. campestre*). This legume produces a small round shaped seed, and most varieties produce roughly 650,000 seeds per pound of seed. Seedling vigor is low to moderate, depending upon the selected variety.

Uses

Livestock: Alsike is used for hay and pasture grazing. It is highly palatable to all classes of livestock. Caution should be taken when feeding Alsike to horses, as it can be toxic under some conditions. Also be cautious when feeding Alsike in large quantities, due to its high bloat hazard.

Wildlife: Alsike is highly palatable to a variety of large wildlife, such as deer, elk and bison. It is utilized as food and cover by small mammals, waterfowl and upland game birds. Canada geese, sandhill cranes, rough grouse and mallard ducks utilize Alsike Clover.

Forage Value

Alsike is capable of producing large amounts of protein and is excellent quality forage for most classes of livestock and wildlife. Although it is generally out-produced by other legumes, it is highly palatable and produces a high relative feed value (RFV). It provides adequate mineral and vitamin content and is commonly grown with other grass species, including Timothy (*Phleum pratense*). As with most legumes, caution should be taken when feeding alsike due to the possibility of bloat.

Distribution and Adaptation

Alsike is adapted to a variety of climatic and soil conditions. It is found growing throughout the entire United States and parts of Canada. Alsike can tolerate fine to medium textured soils with a pH ranging from 5.6 to 7.5. Although it can persist in wetter and more acidic soils better than other clover species, Alsike will not tolerate shady, droughty or saline environments.

Culture

Alsike should be planted ¼ to ½ inches deep in a firm seed bed, preferably in silty loams and/or finer textured soils. Seeding rates depend greatly upon soil type, moisture, and location. An average seeding rate when broadcast seeding Alsike is 6 lbs/acre and 2-4 lbs/acre when drill seeding. Seed should be inoculated prior to planting with appropriate rhizobium to assist plant establishment. Seeding rates are determined using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before field seeding. High rates of nitrogen application can damage or destroy stands of Alsike, and caution should be taken when applying fertilizer. Pastures and hay fields should be irrigated when necessary and/or applicable.

Management

Alsike makes an excellent pasture or hay forage. This legume is adapted to acidic, poorly drained, and/or moderate to low nutrient soils. Alsike can be difficult to control for the first several years of production, due to its aggressive nature and tendency to compete with other plants. It is highly recommend that Alsike be seeded in combination with a grass species to keep it from dominating a forage stand. Typically, Alsike Clover is seeded with a grass species such as Timothy (*Phleum pratense*) to reduce the risk of bloating and toxic affects when feeding to horses. Seeding with a grass species will also help Alsike stand upright making for an easier harvest.

Photo: User BerndH (Wikimedia.org)

A mature stand of Alsike Clover

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This legume will readily move into disturbed areas, and one should be mindful when selecting this species as a forage choice. Alsike requires a minimum of 110 frost-free days for successful reproduction and will continue to bloom throughout the entire growing season. Alsike responds well to irrigation, moderate grazing pressure, and commercial fertilizers. Little research has been conducted concerning potential pests that may affect Alsike in Alaska.

Cultivars and Releases

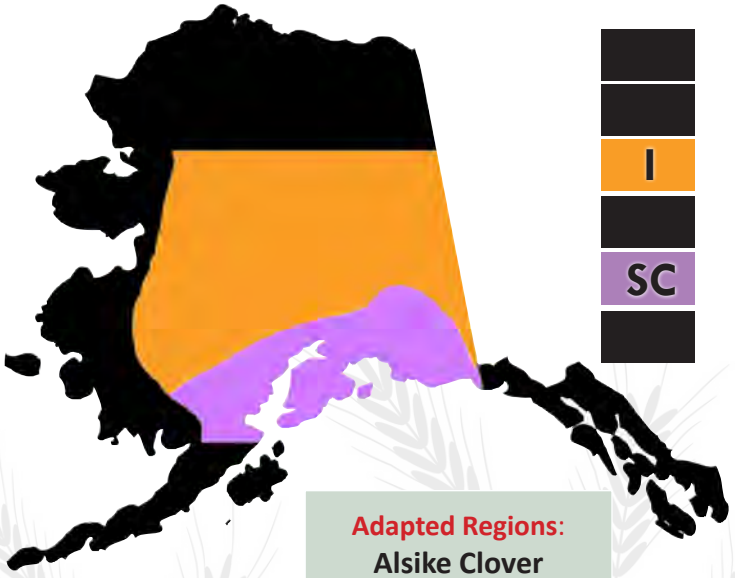
- **'Aurora'** - *Alberta, Canada release.*

- **'Dawn'** - *Canada release.*

References

Natural Resource Conservation Service (NRCS) (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

Montana State University, Extension Service Alsike Clover (*Trifolium hybridum*) [online] Link: http://animalrangeextension.montana.edu/Articles/Forage/Species/Legumes/Alsikeclover.htm



Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	0

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Upright crown	18 - 24 in.	Native	Poor	Poor	Good	Weak	5.6 - 7.5

FIELD PEA

Photo: User Rasbak (Wikimedia.org)

Mature Field Pea plant

Field Pea

Pisum sativum (L.)

Description

Pisum sativum, Field Pea is an annual legume that is prostrate (flat growing) by nature. When intercropped with a grass or small grain, however, the legume can reach a height of 60 to 120 centimeters (24 to 48 inches), depending on variety. Intercropping allows Field Pea to wrap itself around the secondary crop allowing it to grow upward. A single leaf consists of one to three pairs of leaflets that are terminated with a branched tendril (used for climbing). Field Pea leaves are usually pale green with white blotches. This legume has a large round shaped seed and generally produces 1,600 to 5,000 seeds per pound of seed, depending upon variety. Seedling vigor is low to moderate and seeds should be inoculated with proper bacterium when applicable.

Uses

Livestock: Field Pea is used for pasture, hay, silage and/or green cut. It is excellent forage and is highly palatable to all classes of livestock. This legume is often intercropped with annual grasses or oats to obtain optimal nutrient and mineral requirements of livestock.

Wildlife: Field Pea is highly palatable to a variety of wildlife such as deer, elk, moose and bison. It is also utilized as food and cover for small mammals, waterfowl and upland game birds.

Forage Value

Field Pea is highly palatable to all classes of livestock and wildlife. It produces 20 to 25 percent protein on average and contains high levels of carbohydrates. This legume generally produces greater than 85% total digestible nutrients, with low fiber content. Intercropped with annual grasses or small grains, Field Pea can increase combined protein levels two to four times higher than with grass or small grains in monoculture. Field Pea has a moderate bloating factor, compared to other legumes, and should be fed with a grass or small grain forage to reduce the risk of bloating.

Distribution and Adaptation

Field Pea prefers cool, moist conditions and can be found growing throughout parts of Alaska, Canada, Greenland and the contiguous United States. Field Pea is adapted to a variety of soil textures such as sandy loams, silts to heavy clays, and requires adequate drainage with a pH between 5.2 and 6.5. This legume cannot tolerate saline or droughty conditions.

Culture

Field Pea should be planted 1 to 3 inches deep in a moist firm seedbed. This promotes good seed to soil contact. Seeding rates depend greatly upon soil type, moisture, and location. Field Pea should be drill seeded when applicable, and is generally seeded at a rate of 190 lbs/acre, or 7 to 9 plants per square foot. This legume does not compete well with other species. A heavier seeding rate allows field pea to better compete with weeds.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before seeding. Field Pea requires phosphorus and potassium in relatively large amounts. Nitrogen is also necessary if planting in nutrient deprived soils. Over application of nitrogen fertilizer can have adverse affects, however, reducing the potential of nitrogen fixation by plants. Fields should be irrigated when necessary. Irrigation in combination with fertilization can increase field productivity.

Management

Field Pea makes an excellent forage crop if properly managed. It can provide needed nitrogen for grasses and protein for livestock. Field Pea is not typically used for grazing, but rather it is used for silage or green chop. There are several pests that can affect Field Pea production, such as *Mycosphaerella* and *Ascochyta*. These fungi can result in poor plant performance and death if not managed. A preferred management tactic is to rotate field pea stands for several growing seasons, thus not allowing the fungus spores to persist. Fungi can survive for several years on Field Pea stubble and seed. Insects such as aphids, lygus bugs and grass hoppers can also affect Field Pea performance, though they are not usually a problem.

Photo: Jean Tosti (jeantosti.com)

Field Pea, Pisum sativum

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Cultivars and Releases

- **'Century'** - *Canada release.*
- **'Lenca'** - *Canada release.*
- **'Procon'** - *Minnesota release.*

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References

Natural Resource Conservation Service (NRCS) (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

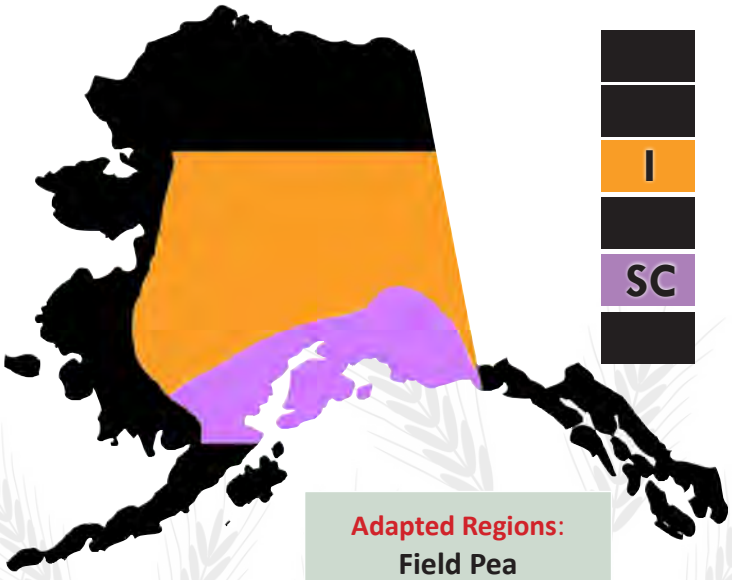
Oelke, E.A., E.S. Oplinger, C.V. Hanson, D.W. Davis, D.H. Putnam, E.I. Fuller, & C.J. Rosen (1991) Dry Field Pea, Alternative Field Crops Manual University of Wisconson Cooperative Extension & University of Minnesota Extension Service. St. Paul MN. 10 pp [online] Link: http://www.hort.purdue.edu/newcrop/afcm/drypea.html

McKay, K., B. Schatz, G. Endres, (2003) Field Pea Production. North Dakota State University Extension Service [online] Link: http://pulseusa.com/pdf/fieldpea.pdf

Klebesadel, L.J., (1966) Planting of Oats & Peas: some yield, quality, and cost considerations. Research report #4. University of Alaska Experiment Station. Palmer, AK 7 pp

Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.



Species not adapted to region

Adapted Regions:
Field Pea

- Interior
- Southcentral

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Upright / Prostrate	24 - 48 in.	Introduced	Poor	Poor	Fair	Moderate	5.2 - 6.5

RED CLOVER

Photo: Michael Apel (Wikimedia.org

Red Clover, Trifolium pratense

Red Clover

Trifolium pratense (L.)

Description

Trifolium pratense, Red Clover is a short lived perennial or biennial legume. It grows erect to decumbent culms that are hairy and hollow. Each leaf consists of a slender stalk which is petiolated and bearing 3 leaflets, which are oblong to obovate (ovalish shape). Red Clover produces numerous flowers borne in compact clusters that are reddish to pink in color. There are two types of Red Clover that are commonly referred to as **Medium** and **Mammoth**. Medium Red Clover ranges in height from 45 - 60 centimeters (18 to 24 inches), while Mammoth Red Clover reaches an average height of 75 centimeters (30 inches). Red Clover grows a series of lateral roots with a tap root that is extensively branched. This legume produces a small kidney shaped seed that is yellow to deep violet in color. Red clover has high seedling vigor and produces roughly 270,000 seeds per pound of seed.

Uses

Livestock: Red Clover is typically used for hay, pastureland, and/or silage. It produces high quality forage that is palatable to all classes of livestock.

Wildlife: Red Clover is highly palatable to large grazing and browsing animals such as deer, elk and bison. It is also utilized as food and cover by small mammals, waterfowl, and upland game birds.

Forage Value

Red Clover can produce high yields and is excellent forage for all classes of livestock and wildlife. Depending on season of harvest, protein content of 15-25% is common. Digestibility and relative feed value start high, but decline with plant maturity. Caution should be taken when feeding *Trifolium pratense* to animals due to the possibility of bloat.

Distribution and Adaptation

Red Clover is adapted to a variety of soils types but grows best in well drained loamy soils. It can be found growing throughout the United States and Canada. Red Clover prefers a pH of 5.5 to 7.5 and has low drought tolerance. This legume can tolerate high moisture environments and has a moderate to low shade tolerance.

Culture

Red Clover should be planted at ¼ to ½ inch deep in well drained loamy to silt loam soils that have a high water holding capacity. It should be inoculated with the appropriate rhizobium innoculant, as this will help with plant establishment and seedling vigor. When seeded alone in pure stands, Red Clover should be drill seeded at a rate of 6-12 lbs/acre and 20-25 lbs/acre when broadcast seeding. Red Clover can also be seeded in mixtures with small grains or grasses like Barley (*Hordeum vulgare*), Timothy (*Phleum pratense*), and Smooth Brome (*Bromus inermis*). Standard seeding rates when seeded in a mix is 4-8 lbs/acre. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before fertilizer is applied. Phosphorus is used in large quantities by Red Clover, which is a limiting factor on most soils. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase overall yields.

Management

Red Clover makes an excellent pasture, hay, or silage forage. It should be harvested ¼ to ½ in bloom during the first cutting. Successive grazing or a second cutting should occur when the legume is ¼ of the way into bloom stage, and at least 2 inches of growth should remain after harvest. Red Clover responds well to fertilizers and should be supplied with ample amounts of phosphorus and/or potash. Red Clover also responds well to irrigation when planted in moderate to well drained soils. When growing Red Clover, one should monitor for powdery mildew in areas of high humidity and/or rainfall. Resistant cultivars have been developed to reduce the occurrence of these pests.

Photo: Wikimedia.org

A mature stand of Red Clover

Cultivars and Releases

- **'Alaskaland'** - *University of Alaska Fairbanks release.*

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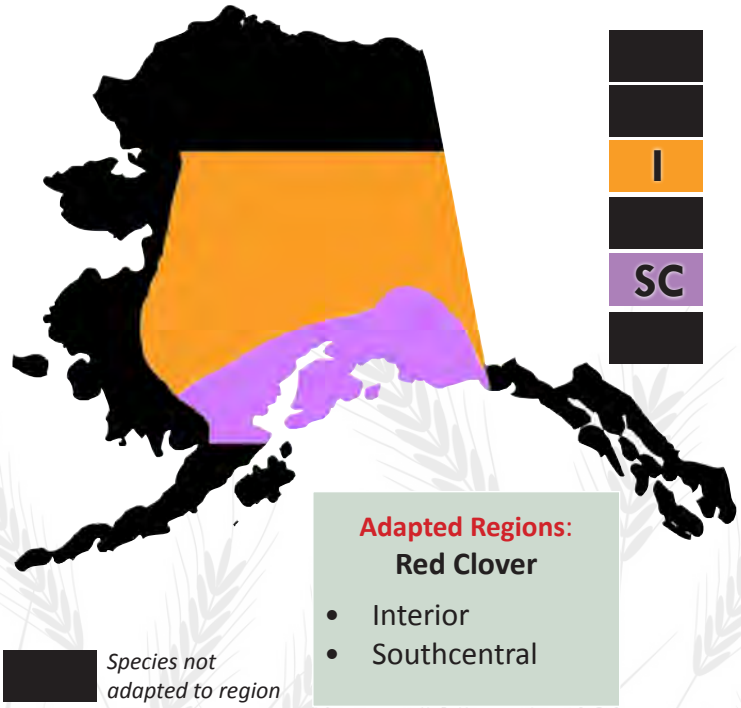
References

Natural Resource Conservation Service (NRCS) (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

Maurice, E.H., D.S. Metcalfe, R.F. Barnes (1973) Forages, The Science of Grassland Agriculture. Iowa State University Press. Ames, Iowa. 755 pp

Hulten, E. (1968) Flora of Alaska and Neighboring Territories. Stanford University press. Stanford California. 1008 pp



Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	1

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Good	Upright crown	18 - 24 in.	Introduced	Poor	Poor	Good	Moderate	5.5 - 7.5

WHITE CLOVER

Photo: Wikimedia .org

White Clover in bloom

White Clover

Trifolium repens (L.)

Description

Trifolium repens, White Clover is a moderate lived perennial legume that can attain heights of 15 - 30 centimeters (6 to 12 inches), depending upon variety. It has a prostrate (flat) growth habit, spreading laterally by stolons. Leaves are composed of three leaflets that sometimes display a watermark or crescent. Leaves and roots are borne along the stolon at each node. Inflorescence (seed-head) consists of 40 to 100 florets that are borne along long slender stalks. Florets are usually white, but sometimes display a pink hue. White Clover has a shallow root system with a primary tap root that seldom roots deeper than 60 centimeters (24 inches). This legume grows a small heart shaped seed, and produces roughly 700,000 seeds per pound of seed. Seedling vigor is low to moderate depending upon the selected variety.

Uses

Livestock: White Clover can be used for pasture, hay or silage production. It is highly palatable to all classes of livestock and has a low potential of bloating.

Wildlife: White Clover is highly palatable to a variety of large wildlife, such as deer, elk, moose and bison. It is also utilized as food and cover by small mammals, waterfowl and upland game birds.

Forage Value

White Clover is highly palatable to all classes of livestock and wildlife. It produces ample amounts of protein with consistently high mineral content, compared to other clover species. This legume is highly digestible and generally produces a higher percentage of amino acids than Alfalfa and/or Red Clover. When nutrients are available, White Clover can concentrate Na, P, Cl, and/or Mo, delivering these nutrients to grazing animals. The risk of bloating is generally moderate to low and is greatly reduced when White Clover is grown with grass species.

Distribution and Adaptation

White Clover is adapted to moist and/or wet conditions and can be found growing throughout the United States, Canada, and some portions of Alaska. It prefers fine texture soils such as silts and clays, containing moderate to high nutrient levels. White Clover will persist in soils with a pH ranging from 5.2-8.0. It will not tolerate or sustain in shady, droughty, saline, or nutrient deprived environments.

Culture

White Clover should be planted ¼ to ½ inch deep in a firm seed bed with well drained silty or clay loam soils. Seeding rates depend greatly upon soil type, moisture, and location. It is highly recommended that White Clover be drill seeded to ensure good seed to soil contact. An average seeding rate when drill seeding White Clover is 2-4 lbs/acre. This seeding rate applies to almost all situations and can be used when planting White Clover with a grass species. A widely accepted ratio of 2:1 is an ideal balance of grass to clover, using the above recommended clover drilling rate. All seeding rates are determined by using Pure Live Seed (PLS) calculations, as described in Appendix B.

Appropriate fertilizer ratios depend upon soil type, chemistry, and location. Soil samples should be collected and analyzed before field seeding. High application rates of nitrogen can damage or destroy stands of White Clover and caution should be taken when applying fertilizer. Pastures and hay fields should be irrigated when necessary and/or applicable. Irrigation in combination with fertilization should increase field productivity.

Management

White Clover makes an excellent pasture forage, but is generally not used for hay or silage production unless large and/or tall cultivars are selected and grown. The cultivar '**Ladino**' is a large and tall growing variety of white clover that is commonly used for hay, silage, and green chop production. White Clover will respond well to irrigation, moderate grazing pressure, and commercial fertilizers. This legume usually displays adverse affects when nitrogen fertilizers are supplied in excess. Liming may be necessary to achieve the optimal pH for white clover growth.

Photo: Forest and Kim Starr (Wikimedia.org)

White Clover, Trifolium repens

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White Clover is typically grown with other forage grasses. This is generally implemented in order for grasses to take advantage of the nitrogen fixating ability of White Clover, and to lower the potential of bloating by adding dry matter to the feed mix. White Clover can be susceptible to a number of root and leaf diseases as well as insect pests. Most of these potential problems exist in mid to lower latitudes.

Cultivars and Releases

- '**Ladino'** (Large type) - *developed in Italy.*

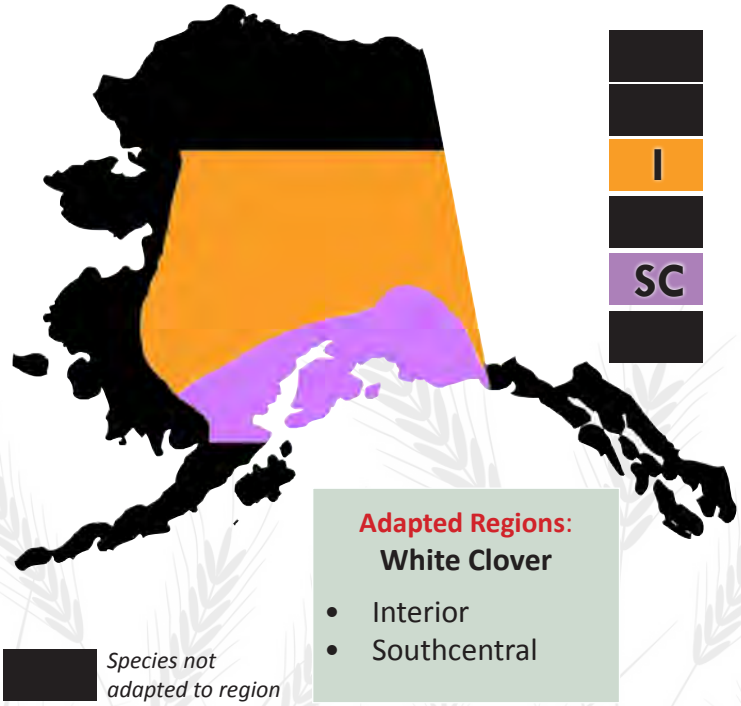
- **'Pilgrim'** (Large type / winter-hardy)
- **'Merit'** (Large type / winter-hardy)
- **'New York'** (Small type)
- **'Kent Wild'** (Small type)

References

Natural Resource Conservation Service (NRCS) (2000) USDA National Plant Data Center [online] Link: http://plants.usda.gov/java/

Maurice, E.H., D.S. Metcalfe, R.F. Barnes (1973) Forages, The Science of Grassland Agriculture. Iowa State University Press. Ames, Iowa. 755 pp

Hulten, E. (1968) Flora of Alaska and Neighboring Territories. Stanford University press. Stanford California. 1008 pp



Soil Texture *				
Coarse	Moderately Coarse	Medium	Moderately Fine	Fine
0	2	3	2	0

* **Soil texture is** graded on a scale of 0 to 3; higher numbers denote textures to which species is most adapted.

Availability	Growth Form	Average Height	Native or Introduced	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness	pH Range
Poor	Prostrate	6 - 12 in.	Introduced	Poor	Fair	Good	Weak	5.2 - 8