

IMPROVED GRASSES AND LEGUMES FOR IDAHO

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GRASSES FOR IRRIGATED AND HIGHER RAINFALL AREAS

Meadow Brome (*Bromus riparius*) — This perennial, long-lived, weakly rhizomatous bunchgrass reaches full productivity in 2 to 3 years. Seedling vigor is strong, and palatability to livestock and wildlife is excellent. Meadow brome is moderately shade tolerant, winter hardy and well adapted to mountain valleys, mountains and subalpine areas. It performs well in alfalfa mixes. It recovers and regrows quickly after grazing or haying. Meadow brome does not go dormant under high summer temperatures or sod in as does smooth brome. It has better regrowth characteristics than smooth brome. Meadow brome is a much better choice for areas prone to late spring and early fall frost than orchardgrass. Use Meadow brome in pasture and hay seedings under irrigation or non-irrigated areas where precipitation is above 14 inches annually. Varieties available are ‘Regar,’ ‘Fleet’ and ‘Paddock.’

Smooth Brome (*Bromus inermis*) — This long-lived, sod-forming grass is very palatable, productive and shade tolerant. It is most useful for erosion control plantings. It recovers slowly when grazed or cut for hay, and it tends to sod bind. Sod binding increases this grass's management requirements. ‘Manchar’ is a northern variety recommended in forage plantings for meadows, hay or pasture in precipitation areas above 14 inches annually. ‘Lincoln’ is a southern variety recommended for erosion control and planting along waterways. Lincoln produces slightly less forage than Manchar.

Tall Fescue (*Festuca arundinacea*) — This long-lived, highly productive, cool-season bunchgrass is suited for use under a wide range of soil and climatic conditions. Tall fescue is tolerant of acidic and saline conditions, but is less palatable than other pasture grasses, which may be grazed out of a stand if mixed with tall fescue. It is best suited to irrigated, sub-irrigated, or moderately wet to wet saline conditions with moisture equivalent to 18 inches annual precipitation. Idaho-adapted varieties include ‘Alta,’ ‘Fawn’ and ‘Forager.’ Note: Fungal endophyte problems developing in livestock foraging tall fescue can be eliminated by seeding with ‘Johnstone’ and ‘Kenhy’ which are endophyte-free varieties. (Johnstone and Kenhy are actually crosses between tall fescue and perennial ryegrass.)

Orchardgrass (*Dactylis glomerata*) — A long-lived, highly productive bunchgrass adapted to well-drained soils with few limitations. Orchardgrass is very shade tolerant and highly palatable to livestock, especially early in the growing season. Orchardgrass is less winter hardy than meadow brome, smooth brome, creeping foxtail or timothy and is more vulnerable to diseases than many pasture grasses. Orchardgrass is compatible with alfalfa or clover mixes. Most varieties require the equivalent of 18 inches of precipitation annually. Varieties mature early, mid and late season. Late-season varieties are preferred in mixtures with alfalfa.

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Several varieties are adapted to Idaho environments: ‘Hallmark’ and ‘Potomac’ (early), ‘Akaroa’ (mid) and ‘Latar’ (late). Another Idaho-adapted variety, ‘Paiute,’ is a dryland orchardgrass that is more tolerant of dryer conditions (to 16 inches mean annual precipitation) than the other varieties.

Perennial Ryegrass (*Lolium perenne*) — This vigorous perennial bunchgrass is relatively short-lived, rapidly developing and adapted to a wide variety of soil conditions. It can be grown under irrigation or on dryland where the effective precipitation is 15 inches or more. Perennial ryegrass grows early in spring, recovers well after grazing and is highly palatable but tends to go dormant in summer. In severe climates perennial ryegrass does not recover from winter dormancy until later in spring. Accurate applications of irrigation water and fertilizer are required for best production. Adapted varieties include ‘Linn,’ ‘Manawa’ (H1), ‘Manhattan,’ ‘Norlea’ and ‘Pennfine.’ Other varieties developed for short rotation pastures or green chop include ‘Bastian,’ ‘Grimalda’ and ‘Reville.’ Many other varieties are available. Varieties for Idaho should be selected from areas of similar climate!

Intermediate and Pubescent Wheatgrass (*Thinopyrum intermedium*) — This is a sod-forming, late-maturing, long-lived grass suited for use as hay or pasture. Intermediate and pubescent wheatgrass begins to grow very early in spring and remains green and palatable into early summer, and again in fall, producing large amounts of quality forage. This species is an excellent choice for situations where only one or two irrigation applications are possible. Intermediate wheatgrass is recommended for areas receiving at least 12 inches annual precipitation. Pubescent wheatgrass is recommended for areas receiving at least 11 inches annual precipitation. Idaho-adapted and recommended intermediate wheatgrass varieties are ‘Rush’ selected for exceptional seedling vigor and forage quality and ‘Greenar’ and ‘Reliant’ selected for forage production and compatibility with alfalfa. ‘Luna’ and ‘Manska’ pubescent wheatgrass are also recommended varieties selected for forage quality and they have slightly more drought tolerance than intermediate wheatgrass.

Tall Wheatgrass (*Thinopyrum ponticum*) — Tall wheatgrass is a long-lived, tall-growing, vigorous, very late-maturing bunchgrass. It starts growing early in spring, reaching maturity in late summer. Palatability is fair early in the season, but the mature plant is very unpalatable. It does not stand continuous close grazing. Late season standing material is good winter forage if protein supplements are provided. Tall wheatgrass is adapted to saline areas such as greasewood and saltgrass sites where the water table is from a few inches to several feet below ground surface and well-drained soils receiving 14 inches or more annual precipitation. Stands should be clipped to a uniform stubble height following each grazing cycle to prevent wolfy plants. Idaho-adapted variety is ‘Alkar.’ ‘Jose’ and ‘Largo’ are two additional southern varieties that may be adapted in warmer climatic areas.

Altai Wildrye (*Leymus augustus*) — A winter hardy, drought resistant, long-lived, cool season bunchgrass, which sometimes has short rhizomes. It is known to root to depths of 15 feet into a free water table. Basal leaves are somewhat coarse, but very palatable and protein levels of 8 percent are common in standing winter-feed. Adapted to moderately deep-to-deep loams to clay loams with 14 inch or greater rainfall. Altai can withstand saline conditions almost as well as tall wheatgrass. Seedlings develop slowly and good seedbed preparation and weed control is essential. ‘Eejay,’ ‘Pearl’ and ‘Prairieland’ are released varieties.

WETLAND GRASSES

Creeping Foxtail (*Alopecurus arundinaceus*) — This long-lived, cool-season, dense, sod-forming grass is adapted to wet fertile meadows and fully irrigated locations receiving at least 18 inches of moisture. It has low seedling vigor, but once established, spreads readily by rhizomes. It is very cold tolerant and can persist in areas where the frost-free period averages less than 30 days. Creeping

foxtail is only moderately salt tolerant but produces excellent quality forage on wet fertile sites, where it is superior to other wetland grasses such as reed canarygrass and timothy. Creeping foxtail responds to very high levels of nitrogen making it an excellent species for nutrient management systems. The only cultivar of this species is ‘Garrison.’

Newhy Wheatgrass (*Elymus hoffmannii*) — A hybrid cross between quackgrass and bluebunch wheatgrass. Newhy is a mildly rhizomatous grass suited for use under a wide range of soil conditions. It begins growth early in the spring, retaining succulence and palatability for livestock later in the summer than many grasses. Some problems exist with seedling vigor and germination, which may reduce initial stands; however, once established it becomes a very vigorous, high producing, high forage quality species capable of withstanding repeated grazing with good recovery. The hybrid is noted for tolerance to strongly saline soils and responds to irrigation, sub-irrigation or moderately wet conditions, and dryland areas where effective precipitation is at least 14 inches. The only cultivar is ‘Newhy.’

Reed Canarygrass (*Phalaris arundinacea*) — A coarse, vigorous, productive, long-lived sod grass adapted to a wide range of environments, reed canarygrass is frost tolerant and suited to wet soils but also somewhat drought tolerant. Initial establishment is slow, but once established, it can withstand continuous flooding for 70 days in cool weather. Reed canarygrass produces an abundance of spring foliage with tremendous annual yields on moist, fertile soils that are high in nitrogen and organic matter. Mature stands prove to be very unpalatable, requiring close grazing and mowing for quality forage production. It invades wet areas along ditches, canals, and streams and is considered a serious pest in many areas, particularly in northern Idaho. Idaho-adapted varieties include ‘Rise’ and ‘Palaton.’

Timothy (*Phleum pratensis*) — This bunchgrass is adapted to cool, humid, wet areas. Timothy performs well, with moderate to high yields, on wet, fertile meadows and fully irrigated locations receiving at least 16 inches of moisture. It establishes cover fairly quickly, volunteers readily on preferred sites and is moderately palatable. It can be severely damaged if grazed too early in the growing season. Timothy hay is considered a premium feed for horses and is compatible in legume mixes. Idaho-adapted varieties are ‘Climax,’ ‘Clair,’ ‘Drummond’ and ‘Mohawk.’

Additional wetland species are available on the commercial market for riparian and wetland restoration. These include Alkali Bulrush, Hardstem Bulrush, Common Cattail, Baltic Rush, Beaked Sedge, Nebraska Sedge, Water Sedge, Creeping Spikerush, and Common Threesquare. Grazing and forage attributes are generally considered lower for these species and they will not be addressed in this handbook.

GRASSES FOR DRYLAND PASTURE

Less than 18 inch Rainfall

Big Bluegrass (*Poa secunda* or *Poa ampla*) — A medium-lived native bunchgrass which re-establishes itself well to result in long-lived stands. Well adapted for early spring grazing, sometimes as much as four weeks ahead of crested wheatgrass, but becomes unpalatable earlier than most grasses. It has relatively low seedling vigor and requires as much as 4 to 8 years to reach full productivity. Because young plants are easily pulled up, grazing should be deferred until roots are well anchored. Recommended sites are sandy to loamy soils on rangeland, and meadows at lower elevations. Big bluegrass is recommended for native species mixtures, and is adapted where effective environment is comparable to 9 inches precipitation. Adapted variety is ‘Sherman.’

Sandberg Bluegrass (*Poa secunda* or *Poa sandbergii*) — A relatively low producing perennial, native, bunchgrass that grows in small tufts. It is considered an important grass for native rangeland soil stabilization and as early spring forage for small wildlife species. Once established, it is one of the most drought tolerant grass species available. It has relatively low seedling vigor and may require up to 4 to 6 years to fully establish. It withstands considerable grazing pressure because of its low growth habit. Sandberg bluegrass is recommended for native species mixtures. It is adapted where effective environment is comparable to 8 inches precipitation. Adapted variety is High Plains Germplasm. Additional accessions are under development.

Mountain Brome (*Bromus marginatus*) — A short-lived vigorous native bunchgrass which reaches full productivity in 1 to 3 years. It volunteers well in some situations, is moderately palatable, shade tolerant and valuable for quick cover. It will be replaced by long-lived species in mixtures over time and is susceptible to seedhead smut. Recommended sites include mountain brush, aspen, conifer forest, subalpine areas and burned-over areas in mountain valleys and plains at medium to high altitudes with 14-16 inches or more annual precipitation. Adapted varieties are ‘Bromar’ and ‘Garnet.’ Garnet is an accession that is seedhead smut resistant.

Idaho Fescue (*Festuca idahoensis*) — This long-lived, native, perennial bunchgrass is palatable in the spring, cures well on the stem and makes good fall forage. Idaho fescue produces best on medium-textured soils, but is also found on coarser-textured soils on steep north slopes. Idaho fescue occurs abundantly on north exposures in areas with 14 inches and above rainfall and is best adapted to areas above 16 inches precipitation. Idaho fescue is a very poor seed producer, so expect seed to be expensive. It is recommended for native species mixtures. ‘Joseph’ and ‘Nezpurs’ are Idaho-adapted varieties.

Indian Ricegrass (*Achnatherum hymenoides*) — A perennial native bunchgrass adapted to sandy soils and dry desert ranges. Seed can be slow to germinate due to the seedcoat and embryo dormancy. Seed can be treated in sulfuric acid or with a cool, moist stratification to improve germination, but is usually not done in large seedings. Untreated seed requires a greater depth of planting than most species to promote seed germination. Dormant fall plantings improve germination and establishment. It is palatable, with the seed production enhancing forage value because of high protein and fat content and is an excellent wildlife species. Good grazing management is necessary if stands are to persist. Recommended sites are sunny exposure with sandy or gravelly soils in the 7 inch and above rainfall areas. It also grows on raw subsoil from lowlands into high mountains. Planting depth can be up to 3 inches in sandy soils and 1 inch in loamy soil. It is recommended for native species mixtures. ‘Nezpar’ is a variety with improved germination characteristics. ‘Rimrock’ was selected for better seed retention characteristics. Both are adapted to Idaho.

Beardless Wheatgrass (*Pseudoroegneria spicata*) — This is a long-lived, drought-tolerant, erect native bunchgrass. It differs from bluebunch wheatgrass in the absence of awns. It begins growth in early spring and readily greens up following fall rains. Beardless wheatgrass is very palatable. Its quality persists longer into the growing season and its yields equal or exceed those of crested wheatgrass. It is best adapted to the wet-winter and dry-summer climates of northern Idaho in the 13 inch and above rainfall areas. It is recommended for native species mixtures. The Idaho-adapted variety is ‘Whitmar.’

Bluebunch Wheatgrass (*Pseudoroegneria spicata*) — This is a long-lived, drought-tolerant bunchgrass that begins growth early in spring and resumes growth after fall rains. Bluebunch wheatgrass is highly palatable and recovers rapidly after being grazed. It has low resistance to repeated grazing. Low plant vigor results in poor stand establishment on sites above 6,500 feet. It is recommended for native species mixtures. ‘Goldar’ is the only Idaho-adapted variety.

Intermediate and Pubescent Wheatgrass (*Thinopyrum intermedium*) — This is a sod-forming, late-maturing, long-lived grass suited for use as hay or pasture. Intermediate and pubescent wheatgrass begins to grow very early in spring and remains green and palatable into early summer, and again in fall, producing large amounts of quality forage. This species is an excellent choice for situations where only one or two irrigations are possible. Intermediate wheatgrass is recommended for areas receiving at least 12 inches annual precipitation. Pubescent wheatgrass is recommended for areas receiving at least 11 inches annual precipitation. Idaho-adapted and recommended intermediate wheatgrass varieties are ‘Rush,’ selected for exceptional seedling vigor and forage quality and ‘Greenar’ and ‘Reliant,’ selected for forage production and compatibility with alfalfa. ‘Luna’ and ‘Manska’ pubescent wheatgrass are also recommended varieties selected for forage quality, and they have slightly more drought tolerance than intermediate wheatgrass.

Crested Wheatgrass, Fairway (*Agropyron cristatum*) — ‘Fairway’ is a very long-lived, drought-tolerant, vigorous introduced bunchgrass. It is similar to standard crested wheatgrass but shorter, earlier maturing, with finer stems and leaves. Establishes on similar sites (10-18" precipitation) as standard and grows more effectively than standard crested wheatgrass at higher elevations. This species does not survive as well as standard crested wheatgrass under severe drought conditions. Adapted varieties are ‘Douglas,’ ‘Fairway’ and ‘Ephraim.’ ‘Ephraim,’ is a tetraploid variety of *A. cristatum* that is weakly rhizomatous in higher rainfall areas. A recent release ‘Douglas’ crested wheatgrass is the first hexaploid on the market. It is characterized as having larger seed, broader leaves and stays green longer than other types mentioned above. It also establishes easily, but produces less. Because it stays green longer than other types, it is a preferred forage selection in the 12 inch and above rainfall areas.

Crested Wheatgrass, Standard (*Agropyron desertorum*) — This very long-lived, drought-tolerant bunchgrass is adapted to a wide range of sites and to precipitation zones as low as 8 to 10 inches. Growth begins early in spring and resumes with fall moisture. Palatability is excellent in spring and late fall. The grass becomes unpalatable during summer dormancy and after seed formation. This grass is more drought tolerant than the fairway type crested wheatgrass. The Idaho-adapted varieties are ‘Nordan’ and ‘Summit.’

Crested Wheatgrass, Hycrest and CD-II (*Agropyron cristatum* x *Agropyron desertorum*) — This is a hybrid cross between standard and induced tetraploid Fairway crested wheatgrass. Seedlings are extremely vigorous during germination and early establishment. ‘Hycrest’ survives under greater competition and lower precipitation than Fairway crested wheatgrasses. It yields more forage (15-20%) in younger stands; is an outstanding seed

producer, but is also more stemmy. Hycrest occupies the same sites as Standard and Fairway crested wheatgrass, and is especially useful in drier sagebrush, cheatgrass sites. Hycrest has established and survived in areas with 8 inches or more precipitation. The adapted cultivars are ‘CD-II’ and ‘Hycrest.’

Siberian Wheatgrass (*Agropyron fragilie*) — Siberian wheatgrass retains its greenness and palatability later into the summer than crested wheatgrass. It has similar yields to crested wheatgrass. It is recommended for areas as low as 7 inches of precipitation and is more drought and salt tolerant than crested wheatgrass. The Idaho-adapted varieties are ‘P-27’ and ‘Vavilov.’ Vavilov, a recent release, has extremely vigorous germination and early establishment.

Slender Wheatgrass (*Elymus trachycaulus*) — This is a short-lived native bunchgrass with good seedling vigor and moderate palatability. It is valuable in erosion-control seed mixes because of its rapid development, salt tolerance, and compatibility with other species. It is well adapted as a cover crop to improve soil tilth and to increase organic matter in saline sites. It tolerates a wide range of conditions and adapts well to high altitude ranges, and more favorable sites in the 12-inch and above rainfall areas on mountain brush areas. It is recommended for native species mixtures. ‘Revenue’ is a Canadian variety, selected for salinity tolerance, seed set, and forage yield. ‘Pryor’ was selected for drought tolerance. Limit slender wheatgrass to 1 pound pure live seed (PLS) per acre in native mixes. Higher rates affect the establishment of slower developing native species.

Snake River Wheatgrass (*Elymus wawawaiensis*) — This is a native wheatgrass of the valleys of the Snake River and its tributaries in Washington, eastern Oregon, and western Idaho. It is similar in appearance to bluebunch wheatgrass, but differs morphologically in having narrower, pointed to needle-like glumes, a more overlapping spike, and basal leaf sheaths without hairs. It is adaptable to most bluebunch wheatgrass areas but is more vigorous and productive in the lower, 8-12 inch precipitation areas adapted to bluebunch wheatgrass. It is highly recommended for native species mixtures. The only variety is ‘Secar.’ Secar is considered more drought tolerant than bluebunch wheatgrass.

Streambank Wheatgrass (*Elymus lanceolatus*) — A long-lived, drought tolerant, creeping sod-former adapted to fine-medium textured well-drained soils. It has excellent seeding vigor and is particularly well adapted to erosion control where effective precipitation is 8-25 inches. It has little value as a forage crop and is primarily used for stabilization of roadsides, ditchbanks, and lakeshores. It has also been used as a drought tolerant turfgrass, but care must be taken to not over-irrigate or stand will be lost. It is recommended for native species mixtures. The only variety is ‘Sodar.’

Thickspike Wheatgrass (*Elymus macrourus*) — A long-lived, native sod-forming grass widely distributed in the northern part of the Intermountain Region. Drought tolerant, early spring growth, fair palatability, but low forage production characterizes thickspike wheatgrass. More drought tolerant than western wheatgrass, it is well suited for wind erosion control on coarse-textured soils. It is best utilized as forage when fully mature. Adapted to disturbed range sites and dry areas subject to erosion, roadsides, and waterways in the 8-18 inch precipitation zones. It is recommended for native species mixtures. Improved varieties include ‘Bannock,’ ‘Schwendimar,’ and ‘Critana.’ Bannock is a new, more productive release for the Snake River and Great Basin areas.

Basin Wildrye (*Leymus cinereus*) — Basin wildrye is a slightly spreading, robust, native bunchgrass. It is tall, coarse, long-lived, low in palatability, but useful for calving pasture and wildlife forage cover. Poor seedling vigor usually results in sparse stands, but once established is highly productive. Mature plants are unpalatable and need to be managed for use at earlier periods

with grazing management scheduled to avoid the high growing point. Great care must be taken to avoid close grazing or clipping, which may result in heavy plant loss in a single season. Winter grazing with protein supplements utilizes old coarse growth and allows more effective use of new growth. It is adapted to saline or alkaline lowlands, flood plains, and deep clayey to loamy soils that receive more than 9-14 inches precipitation, and recommended for native species mixtures. Adapted varieties are 'Magnar' and 'Trailhead.'

Russian Wildrye (*Psathyrostachys juncea*) — This long-lived, introduced bunchgrass grows rapidly in spring and remains green and palatable through summer and fall as long as soil moisture is available. Russian wildrye endures close grazing better than most grasses. It cures well on the stump, better than most grasses, and makes excellent late fall and winter feed. It is useful on soils too saline for crested wheatgrass and too dry for tall wheatgrass. It is recommended for mixtures with crested wheatgrass varieties. Idaho-adapted varieties are 'Bozoisky-Select,' 'Mankota' and 'Swift.' It is very important to prepare a firm seedbed and plant seed shallow (1/4 inch) to ensure stand establishment.

LEGUMES AND FORBS

Alfalfa (*Medicago sativa*) — Alfalfa is a very productive, palatable perennial legume. There are numerous varieties, which have been developed with characteristics for specific purposes. Alfalfa does not persist on rangelands under moderate to heavy grazing unless rest periods occur. Adapted varieties are continuously being released. Contact your area agricultural Extension agent or see the Alfalfa Council's annual publication *Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties* for current releases (<http://www.alfalfa.org/>).

Small Burnet (*Sanguisorba minor*) — Small burnet is semi-evergreen, moderate yielding, non-leguminous, deep rooted, and has good forage palatability traits. Growth is most vigorous in fall and spring. It is best adapted to well-drained soils. It can be grown on low fertility, droughty soils as well as moderately wet acid soils. It establishes with ease on most sites, but will not persist below 14 inches of precipitation. It is recommended for species mixtures. 'Delar' is an improved forage yielding variety.

Alsike Clover (*Trifolium hybridum*) — Alsike clover is a short-lived, perennial legume that produces abundant palatable foliage on fertile soils. It is suited for irrigated hay or pasture or for dryland plantings where the effective precipitation is 18 inches or more. It is adapted for use on poorly drained, acid soils, especially in cool areas. The Idaho-adapted variety is 'Aurora.'

Red Clover (*Trifolium pratense*) — This short-lived, perennial legume is suited primarily for hay and silage when grown under irrigation or for dryland plantings where the effective annual precipitation is 25 inches or more. Red clover requires well-drained soil, produces best on medium-acid to neutral soils and will reseed under favorable conditions. Idaho-adapted varieties are 'Kenland,' 'Dollard,' 'Redman II' and 'Arlington.'

White Clover (*Trifolium repens*) — White clover is a long-lived, spreading perennial legume suited primarily for pasture. It can be grown under irrigation or on dryland where the effective precipitation is 18 inches or more. White clover requires medium to high soil fertility and adequate moisture for optimum production. Idaho-adapted varieties are 'Ladino' (large type), 'Merit,' 'Kent Wild' and 'New York' (small type).

Blue Flax (*Linum perenne*) — Blue flax is an introduced perennial semi-evergreen forb that prefers well-drained soils ranging from moderately basic to weakly acidic. It prefers open areas, but does have some shade tolerance. It is intolerant of poor drainage, flooding and high water tables. Flax does well seeded in mixtures with other species. It can be surface seeded on a disturbed seedbed and should not be seeded deeper than 1/8 inch. This semi-evergreen forb is eaten readily by big game especially during spring and winter. This species establishes well, seeded on disturbed sites. ‘Appar,’ an introduced variety, was released for its superior forage, seed production and palatability to livestock and wildlife. Native flax accessions are under development, but no releases have been made.

Globemallow species (*Sphaeralcea spp.*) — Gooseberryleaf globemallow is a native, drought-tolerant perennial native forb. Greatest area of occurrence is between 8 and 12 inches annual precipitation.

Scarlet globemallow is a native, low-spreading perennial with creeping rhizomes. This species has considerable drought resistance and establishes especially well on disturbed sites. It is an excellent soil stabilization species for harsh sites.

These species have been successfully seeded in the shadscale, juniper and sagebrush communities and on disturbed sites with basic soils. They are not recommended in pure stands. Fall seeding is recommended. Seed should not be planted deeper than 1/4 inch. Livestock and big game make fair to good use of these species. They green up early in the spring and following fall rains. They can be successfully seeded on disturbed, exposed, eroded sites in harsh environments. Globemallow is commercially available, but no released varieties are available.

Cicer Milkvetch (*Astragalus cicer*) — It is an introduced, rhizomatous, non-bloating legume with forage quality and production similar to alfalfa. Cicer milkvetch is best adapted to deep soils that receive more than 14 inches annual precipitation. It can tolerate semi-wet soil conditions where watertable may be high for a short period in the spring. This species is slow to establish due to its very hard seed; scarification of seed is recommended. Recommended varieties include ‘Lutana’ and ‘Monarch.’

Penstemon species (*Penstemon spp.*) –

Alpine Penstemon (*Penstemon venustus*) — A perennial, cool season native half shrub, with a strong taproot and woody base. The flowers are bright lavender to purple. Its natural habitat is from 1,000 to 6,000 feet elevation and 20-35 inches precipitation. It does best in full sunlight, on open slopes of mountain valleys and foothills. It does not tolerate poorly drained soils. Potential uses include erosion control, plant diversity and beautification on droughty sites. The Clearwater Selection is a recent release of Alpine penstemon.

Firecracker Penstemon (*Penstemon eatonii*) — A perennial to short-lived, erect, cool season native forb that has a fibrous root system, stems that are decumbent or reclining, leaves that are slightly pubescent, flowers on upright stems that are bright red and bloom in mid summer to fall. It is adapted to sagebrush, juniper and ponderosa pine zones at 3,300 to 8,000 feet elevation in 10-16 inch precipitation zones. It does best in full sunlight and can survive cold winter temperatures if snow insulates the plant. It does not do well in poorly drained areas. Potential uses include erosion control, diversity and beautification. The Richfield Selection is a recent release of firecracker penstemon.

Palmer Penstemon (*Penstemon palmeri*) — A relatively short-lived, semi-evergreen native forb that occurs in the blackbrush, sagebrush-grass and juniper types in basic and slightly acidic soils, on disturbed and exposed sites. It is a pioneering species and is especially suited for seeding exposed, depleted, and disturbed sites. It has considerable potential as an ornamental. Big game and livestock readily seek out this species during winter and spring months. It can be fall broadcast or drilled. Do not seed deeper than 1/8 inch. The only released variety is ‘Cedar,’ selected for its wide area of adaptation, winter succulence, forage production and preference of livestock and wildlife.

Rocky Mountain Penstemon (*Penstemon strictus*) — A perennial, semi-evergreen native forb that occurs in the upper juniper, mountain big sagebrush, mountain brush, and open areas in aspen and coniferous forest. This species does well with over 15 inches annual precipitation and on rocky and sandy loam soils that range from weakly acidic to saline. Livestock and wildlife utilize it. Ornamentally, this species has potential. Considerable use made of this species in seeding to stabilize depleted, disturbed, and eroded sites. Seed can be broadcast or drilled up to 1/8 inch deep. Fall seeding is recommended. The variety ‘Bandera’ was released for its long-lived and seed production characteristics.

A number of penstemons are seeded primarily for soil stabilization on depleted, disturbed and erosive areas and as ornamentals. These include Low penstemon (*P. humilis*), Rydberg penstemon (*P. rydbergii*) and Thicketleaf penstemon (*P. pachyphyllus*). However, no released varieties have been made to date.

Sainfoin (*Onobrychis viciaefolia*) — A introduced, cool-season, non-bloating, early-blooming legume that is slightly less productive than alfalfa. Sainfoin is adapted to deep, alkaline, medium-textured soils and is not tolerant of wet soils, high water table or over irrigation. Sainfoin can be grazed or used for hay. Idaho-adapted varieties are ‘Eski’ for dryland plantings and ‘Remont’ for irrigated plantings.

Sweetclover, Yellow (*Melilotus officinalis*) and Sweetclover, White (*Melilotus alba*) — It is an introduced tall, stemmy, deep-rooted, biennial legume. Sweetclover will reseed and maintain a stand if perennials do not crowd it out. It is commonly used in seeding mixtures as a cover crop. It provides poor-quality forage at middle to later growth stages. It contains coumarin, a blood anti-coagulant that may kill animals foraging on pure stands. The Idaho-adapted variety is ‘Madrid.’

Birdsfoot Trefoil (*Lotus corniculatus*) — This long-lived, deep-rooted legume is suited for use as pasture or hay. It can be grown under irrigation or on dryland where the effective precipitation is 18 inches or more. It does not create bloat problems. Birdsfoot trefoil is very winter hardy and useful at high elevations. When mature, its quality persists longer than alfalfa's. It is tolerant of poor drainage and has some drought tolerance. Idaho-adapted varieties are ‘Empire,’ ‘Maitland’ and ‘Dawn.’ For more information see University of Idaho Current Information Series 831, *Birdsfoot Trefoil Production in Northern Idaho*.

Western Yarrow (*Achillea millefolium*) — Western yarrow is a perennial native forb and a member of the sunflower family. It can be found from the valley bottoms to the subalpine zone. Greatest areas of occurrence are mountain brush, aspen, and open timber. It has some shade, drought, and grazing tolerance and can be found in sandy to loamy soils ranging from weakly basic to weakly acid. Yarrow spreads by seed and rhizomes. It does an especially good job on disturbed and depleted areas. Fall seeding is recommended. Depth of seeding should not exceed 1/4 inch. It can be seeded with other species and is not recommended for pure stands. This forb is under development, but no releases have been made to date.

For more detail on selected grasses and legumes, see *Performance of Forage and Conservation Grasses in Northern Idaho*, University of Idaho Bul. 798; *Performance of Perennial Forage Legumes in Northern Idaho*, University of Idaho Bul. 802; *Annual Ryegrass*, PNW 501; *Orchardgrass*, PNW 502; *Perennial Ryegrass*, PNW 503; *Tall Fescue*, PNW 504; *Intermountain Planting Guide*, Utah State University Bul. AG 510.