United States Department of Agriculture
NRCS Natural Resources Conservation Service
Plant Guide

INDIAN RICEGRASS

Achnatherum hymenoides (Roemer & J.A. Schultes) Barkworth

plant symbol = ACHY

Contributed By: USDA, NRCS, Idaho State Office

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Bioinformatics Working Group
Texas A&M University

Alternate Names
Oryzopsis hymenoides, *Stipa hymenoides*

Uses
Ethnobotanic: The nutritious seed of Indian ricegrass was one of the staple foods of American Indians.

Grazing/rangeland/hayland: Indian ricegrass is highly palatable to livestock and wildlife. It is preferred forage for cattle, horses, and elk in all seasons. It is considered a preferred forage for sheep, deer, and antelope in spring and a desirable forage for sheep, deer, and antelope in late fall and winter. It reaches its peak production from mid-June through mid-July and holds its nutrient value well at maturity. It is not considered valuable as a hay species.

Erosion control/reclamation: One of the greatest values of Indian ricegrass is to stabilize sites susceptible to wind erosion, and it is well adapted for the stabilization of disturbed sandy soils in mixes with other species. Indian ricegrass and needle-and-thread grass are often early-seral or pioneer species that establish naturally on disturbed sandy sites. Indian ricegrass is also one of the first species to establish on cut-and-fill slopes.

Indian ricegrass does not compete well with aggressive introduced grasses during the establishment period. It is very compatible with slower-developing native grasses, such as Snake River wheatgrass (*Elymus wawawaiensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), thickspike wheatgrass (*Elymus lanceolata* ssp. *lanceolata*), streambank wheatgrass (*Elymus lanceolatus* ssp. *psammophila*), western wheatgrass (*Pascopyrum smithii*), and needlegrass species (*Nassella* spp. and *Hesperostipa* spp.). Drought tolerance, combined with a fibrous root system and fair-to-good seedling vigor, make Indian ricegrass desirable for reclamation in areas receiving 8 to 14 inches annual precipitation.

Wildlife: Forage value is mentioned in the grazing/rangeland/hayland section above. Due to the abundance of plump nutritious seed, Indian ricegrass is considered an excellent food source for birds, such as mourning doves, pheasants, and songbirds. Rodents collect the seed for winter food supplies. It is considered good cover for small animals and birds.

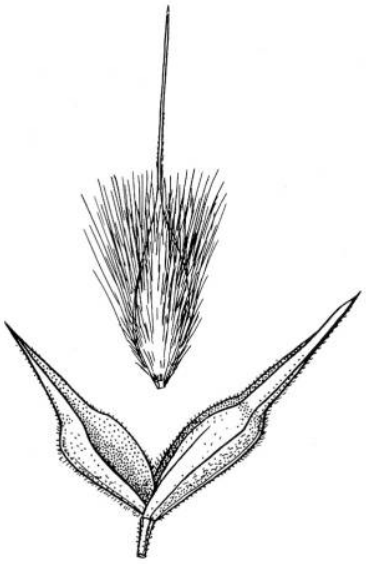
Beautification: Due to its attractive seed heads, Indian ricegrass is recommended for roadside, campground, and other low-rainfall locations for beautification. It can also be used in floral arrangements.

Status
Consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status, such as state noxious status, and wetland indicator values.

Description
General: Grass Family (Poaceae). Indian ricegrass grows 8 to 30 inches tall. It has many tightly rolled, slender leaves, growing from the base of the bunch giving it a slightly wiry appearance. The ligule is

about 6 mm long and acute. It has a wide spreading panicle inflorescence with a single flower at the end of each hair-like branch. Seeds are round to elongated, black or brown, and generally covered with a fringe of short, dense, white callus hairs. Indian ricegrass has fair-to-good seedling vigor. Seeds of most accessions are very slow to germinate due a thick hull and embryo dormancy.

Distribution
Indian ricegrass is a widely distributed, short to medium-lived, native, cool-season bunchgrass generally found in the plains, foothills, mountains, and intermountain basins of the western United States. It favors dry and primarily loamy-sandy-gravelly sites. For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.



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Adaptation
Indian ricegrass is very winter hardy and has a broad climatic adaptation. It can be found at elevations from 2,000 to 10,000 feet. It grows best in areas with average annual precipitation of 8 to 14 inches. It has been seeded in areas with as low as 6 inches of rainfall and reproduced. It is also found on sites with precipitation well above 14 inches. It prefers sandy coarse-textured soils in its southern areas of adaptation and can be found on sands, fine sandy loams, silt loams, clay loams, gravelly, rocky, to shale areas in the mid-northern areas of its adaptation. It does well on hot, dry southern exposures. In Colorado, Utah, Nevada, and locations to the south, 'Nezpar' does best above 6500 feet elevation and 'Paloma' does best below 6500 feet elevation. 'Nezpar' and 'Rimrock' are considered the best selections for seedings in the northern range of adaptation.

Indian ricegrass is often an early seral or pioneer species, establishing seedlings in open or disturbed sites and on sandy soils. It is relatively short-lived for a perennial grass and reproduces by seed.

It does not tolerate poorly drained soils, extended periods of inundation, winter flooding, or shading. It is tolerant of weakly saline and sodic conditions, but prefers neutral soils. It can tolerate fire late in the growing season and when the plant is dormant without serious damage.

Species often associated with Indian ricegrass include the big sagebrush complex (*Artemisia tridentata*), saltbush species (*Atriplex* spp.), winterfat (*Krascheninnikovia lanata*), juniper species (*Juniperus* spp.), needle-and-thread (*Hesperostipa comata*) and other needlegrasses, bluebunch wheatgrass, Snake River wheatgrass, thickspike wheatgrass, streambank wheatgrass, western wheatgrass, and blue grama (*Bouteloua gracilis*).

Establishment
Planting: This species should be seeded with a deep furrow drill at a depth of 1/2 to 1 inch on medium to fine-textured soils and 1 to 3 inches on coarse-textured soils. A deeper planting depth puts the seed in contact with moist soil conditions, which aids in the stratification process and makes the seed less likely to be dug up by rodents. Use of older seed up to 4 to 6 years of age may have improved germination and should be planted at 1/2 to 1-inch depth. Research has shown that mechanical scarification of the seed improves germination of dormant seed lots (Jones and Nielson, 1992a).

The seeding rate recommended for Indian ricegrass is 6 pounds Pure Live Seed (PLS) per acre or 30 PLS seeds per square foot. If used as a component of a mix, adjust to percent of mix desired. For rangeland mixtures, approximately 30 to 50 percent of the mix or 2 to 3 pounds PLS/acre should be considered. For mine lands and other harsh critical areas, the seeding rate should be doubled. Two separate seeding operations may be necessary when planting seed mixes, because most species should be planted at shallower depths than the depths recommended for Indian ricegrass. This means that Indian ricegrass should be planted first, followed by the seeding operation for the rest of the mix.

The best seeding results are obtained from dormant seeding in late fall on medium to light-textured soils. Dormant fall seeding may improve germination of dormant seeds. Spring and summer seedings are not recommended. Seedling vigor is fair to good, but the seed may have a high percentage of hard seed and stands may take 2 to 5 years to fully establish. Indian ricegrass responds well to light irrigation and light fertilization.

Stands may require weed control measures during establishment. Bromoxynil may be applied at the 3-4 leaf stage for early suppression of young broadleaf weeds and application of 2,4-D should not be made until plants have reached the 4-6 leaf stage or later. Mow when weeds are beginning to bloom to reduce weed seed development. Grasshoppers and other insects may damage new stands and use of pesticides may be required. All herbicides and pesticides should be applied according to the label.

Management
Indian ricegrass establishes slowly and new seedings should not be grazed before the late summer or fall of the second growing season. It makes its initial growth in early spring and matures seed by mid-summer.

New stands should not be grazed until the plants are producing seed. Indian ricegrass benefits from grazing use if it is moderately grazed in winter and early spring. Livestock should be removed while there is still enough growing season moisture to allow recovery, growth, and production of seed. Stands will deteriorate under heavy spring grazing. The third and fourth years following establishment may be critical to stand survival. Reproduction is dependent on seed production and quality seed in the soil bank must be available as mature plants begin to die out of the stand. Grazing management with rest or deferment schedules that allow plants to produce seed every 2 to 3 years is recommended. By the eighth or ninth year following establishment, the seed bank should be adequate, with a wide variation of low dormancy to hard seed to ensure long-term stand survival with proper grazing management.

Environmental Concerns
Indian ricegrass is relatively short-lived and spreads via seed distribution. It is not considered "weedy" or an invasive species, but can spread into adjoining vegetative communities under the proper management, climatic, and environmental conditions. Most seedings do not spread from original plantings, or if they do spread, the rate of spread is not alarming. Indian ricegrass is self-pollinated, but may occasionally cross with native needlegrass species (Jones 1990). These natural crosses generally produce sterile hybrids.

Seed Production
Seed production of Indian ricegrass has been very successful under cultivated conditions. Row spacing of 24 inches under irrigation or high precipitation (> 16 inches annual precipitation) to 36 inches on dryland is recommended. Seeding rates for seed production range from 3.0 pounds PLS per acre on dryland to 4.0 pounds PLS per acre under irrigated conditions. Cultivation will be needed for weed control and to maintain row culture.

Seed fields are productive for about five years. Field moisture during the fall, soil fertility, and plant re-growth determine the yield the succeeding year. Birds will feed on seed and wind can shatter seed from inflorescence prior to harvest.

Average production of 100 to 150 pounds per acre can be expected under dryland conditions in 14-inch plus rainfall areas. Average production of 200 to 300 pounds per acre can be expected under irrigated conditions.

Harvesting can be completed by direct combining in the hard-dough stage or by windrowing followed by combining. Windrowing helps to ensure a more complete threshing. Indian ricegrass is so

indeterminate that windrowing allows final curing in the swath prior to combining. Windrowing also reduces the risk of loss of seed from wind. It is very difficult to thrash all the seed if direct combined, and it may be beneficial to re-thrash windrows after a few days for seed not threshed in the first operation. Seed heads have moderate to high rates of shatter and require close scrutiny of maturing stands. Seed is generally harvested from early July to early August. Seed must be dried immediately after combining (moisture content should be 12 percent in bins/15 percent in sacks).

Cultivars, Improved and Selected Materials
Foundation and registered seed is available through the appropriate state Crop Improvement Association or commercial sources to grow certified seed.

'Nezpar' Indian ricegrass was originally collected in 1935 from a site south of White Bird, Idaho by the Pullman, Washington Plant Materials Center (PMC) staff. It was selected from 152 accessions for its vegetative characteristics and low seed dormancy by the Aberdeen, Idaho PMC and released in 1978. It is adapted to the Northwest and Intermountain regions where precipitation averages 8 inches or above. It has survived in some plantings with 6 inches annual rainfall. It prefers gravelly to loamy to sandy soils. It is noted for its large erect plant type, robust stems, abundant leaves, medium to small dark nearly hairless elongated seeds (< 50 percent dormant seeds), and good to excellent seedling vigor. Certified seed is available and Breeder seed is maintained by Aberdeen PMC.

'Paloma' Indian ricegrass was collected in 1957 west of Pueblo, Colorado at about 5000 feet elevation on medium soils. It was selected by Los Lunas, New Mexico PMC and released cooperatively by the PMC and New Mexico Agricultural Extension Service in 1974. It is adapted to the Southwestern Regions of the Western United States. It is considered very drought tolerant, has good seedling vigor, forage, seed yields, and is long lived. Paloma has good regrowth and spring recovery. It is considered the best Indian ricegrass cultivar for the Southwestern Regions of the Western United States. Certified seed is available, and Breeder seed is maintained by Los Lunas PMC.

'Rimrock' Indian ricegrass was collected in 1960 from a native site averaging 10 to 14 inches of precipitation, north of Billings, Montana, at about 3600 feet elevation on sandy soils. The Bridger PMC; ARS, Logan, Utah; and the Montana and Wyoming Agricultural Experiment Stations released Rimrock in 1996, primarily because of its ability to retain mature seed better than Nezpar or Paloma. The more acute angle of glumes on Rimrock as compared to Nezpar and Paloma helps it to retain seed longer and reduces seed shatter caused by wind or rain. Certified seed is available and Bridger PMC maintains Breeder seed.

Ribstone germplasm Indian ricegrass was developed from an accession collected in 1993 north of Taber, Alberta, Canada on a sandy soil by USDA-ARS and Ducks Unlimited Canada. Ribstone was released by USDA-ARS, the Utah Agricultural Experiment Station, and Ducks Unlimited Canada in 2002. Its parental accession was selected for more acute angle of the glumes (similar to Rimrock) to reduce seed shattering. Ribstone's intended use is for southeastern Alberta and adjacent portions of Saskatchewan and Montana. Early-generation seed for propagation is available from Ducks Unlimited Canada and USDA-ARS (Logan, UT) maintains G-2 seed.

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Prepared By
Daniel G. Ogle, Plant Materials Specialist
USDA, NRCS, Boise, Idaho

Loren St. John, Team Leader
USDA, NRCS, Plant Materials Center, Aberdeen, Idaho

Dr. Thomas A. Jones
USDA, ARS, Forage and Range Laboratory, Logan, Utah

Species Coordinator
Daniel G. Ogle, Plant Materials Specialist
USDA, NRCS, Boise, Idaho

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