

RS HYBRID WHEATGRASS

Elymus hoffmannii K.B. Jensen
& K.H. Asay

Plant Symbol = ELHO3

Contributed by: USDA NRCS Idaho Plant Materials Program and USDA ARS Forage and Range Laboratory.



'Newhy' Hybrid Wheatgrass. K. Jensen, ARS, UT

Alternate Names

Elytrigia repens x *Pseudoroegneria spicata*,
RS wheatgrass
x *Pseudelymus*
'Newhy'

Uses

Grazing/range/pasture: RS hybrid wheatgrass is an advanced-generation hybrid between quackgrass (*Elymus repens*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) (Jensen et al. 2001). It has fair to good forage quality for cattle, sheep and horses (Snyder, 1992).

Hay: RS hybrid wheatgrass can provide more than one crop of hay each year with proper management. Under high soil fertility and adequate irrigation, forage yields are lower than other forage grasses such as orchardgrass, meadow brome and tall fescue (Jensen et al. 2001).

Wildlife: RS hybrid wheatgrass provides fair to good cover for small mammals, nongame birds, upland game birds and waterfowl (Snyder, 1992).

Erosion control/reclamation: RS hybrid wheatgrass is especially suited for erosion control and reclamation on slight to moderate saline soils.

Status

Consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Description

General: Grass Family (Poaceae). The botanical description of *Elymus hoffmannii* is from a breeding line of plants developed from seeds collected in Erzurum Province, Turkey by J.A. Hoffman and R.J. Metzger in 1979 (Jensen and Asay, 1996). There is no information regarding its native distribution.

RS hybrid wheatgrass is slightly to moderately rhizomatous with glabrous culms reaching, 54-135 cm (21-53 in). Leaves are evenly distributed along the culm; sheaths are glabrous and auricles absent to 1 mm (0.003 in), truncate and erose. Leaf blades are 5-13 mm (0.02-0.05 in) wide, flat to involute, the top surface smooth and glabrous, the bottom surface smooth with the veins closely spaced, more or less equally prominent, smooth or scabrous. The spikes are 10-50 cm (4-20 in) long, 0.8-1.8 cm (0.3-0.7 in) wide with 1 spikelet per node. Spikelets are 15-27 mm (0.06-0.11 in) long with 5-7 florets. Glumes are equal, 5-11 mm (0.02-0.04 in) long, 1.3-1.8 mm (0.05-0.07 in) wide and disarticulation is above the glumes. *Elymus hoffmannii* differs from *Elymus repens* (quackgrass) primarily by having longer leaves, shorter awns on the glumes, and less rhizome development. *Elymus hoffmannii* is predominantly cross-pollinated and chromosome number is $2n = 42$, $x = 7$. The description for *Elymus hoffmannii* was written to encompass the released cultivar 'Newhy' and some taxonomists believe the cultivar should be identified as *x Pseudelymus* 'Newhy' because it is derived from an artificial cross between *Elymus*

repens and *Pseudoroegneria spicata* (Barkworth, Campbell and Salomon, 2007).



'Newhy' spikelet. D. Tilley, NRCS, ID

Distribution: The description of *Elymus hoffmannii* was described from a breeding line of plants developed from seeds collected in Erzurum Province, Turkey by J.A. Hoffman and R.J. Metzger in 1979 (Jensen and Asay, 1996). There is no information regarding its native distribution. In North America, its distribution is limited to sites that have been planted with this species either as a component of a seeding mix or as a monoculture.

For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

Adaptation

RS hybrid wheatgrass is a long-lived perennial grass adapted to temperate semiarid rangelands that receive at least 13 inches of annual precipitation. It is adapted to foothills, sagebrush and juniper sites up to 8,000 feet elevation and on saline dry or wet bottomland (Ogle, et. al., 2009). It is well-suited for sites with moderate to high levels of salinity and can be used for irrigated and limited irrigation pasture. On a saline site near Roosevelt, Utah, forage yields of RS hybrid wheatgrass were similar to tall wheatgrass and intermediate wheatgrass, and significantly greater than Russian wildrye, creeping foxtail, basin

wildrye and Altai wildrye (Jensen, Asay, and Waldron, 2003).

Under irrigation, it yields significantly less than orchardgrass, tall fescue or meadowbrome but is significantly more drought tolerant than these grasses (Jensen, Asay, and Waldron, 2001). Forage quality compares well with brome and orchardgrass and exceeds crested wheatgrass. Compared with intermediate wheatgrass, it has improved palatability and similar levels of drought tolerance. Although it is a cool season grass, its leaves retain their green color and succulence during the late summer better than other wheatgrass species, and if ample soil moisture exists, high quality forage is often available after seed maturity (Asay and Horton, 1991).

In two plant materials salinity trials conducted in Utah, RS hybrid wheatgrass (RS-H) performed well. RS-H and 'Newhy' performed about the same but it appeared that RS-H utilized nitrogen better and did not display chlorosis to the same extent as Newhy. Both materials were rated as having excellent palatability (Ogle, et. al, 2009).

Establishment

Some problems exist with germination and seedling vigor which can reduce initial stands. However, once established, it becomes a vigorous, high yielding, nutritional forage that can withstand repeated grazing with good regrowth (Ogle, et. al., 2009). Seed quality and germination is lower than other wheatgrass species and improved seed quality continues to be a breeding objective (Asay and Horton, 1991).

RS hybrid wheatgrass should be planted with a drill to a depth of ¼ to ½ inch. The single species seeding rate is 8 pounds PLS per acre. If used as a component of a mix, adjust to percent of mix desired. When broadcast planting seed and for harsh critical planting areas and saline sites, the seeding rate should be increased to 14 – 16 pounds PLS per acre (Ogle, et. al., 2009). Excellent stands have been obtained on dryland sites when seed is planted in late fall to ensure that germination does not occur until the following spring. Spring seedings on dryland can be effective, but can be risky because weather conditions and excess soil moisture can delay planting until there is insufficient time for seeding establishment before hot temperatures of summer (Asay and Horton, 1991).

Stands may require weed control measures during establishment, but application of broadleaf herbicides such as 2,4-D should not be made until plants have

reached the four to six leaf stage. Mow above seedlings when weeds are beginning to bloom to reduce weed seed production. Grasshoppers and other insects may damage new stands and use of insecticides may be required. Always read and follow label directions when applying pesticides.

Management

RS hybrid wheatgrass begins growth early in the spring, retaining succulence and palatability for livestock later in the summer than many grasses. It can provide two or more crops of hay with proper management and can withstand repeated grazing with good recovery. Another option to consider is to harvest a hay crop in early summer and graze regrowth in late fall or early winter. Under intensive management, RS hybrid wheatgrass requires at least 25 days between grazing events. During hot summer temperatures, resting periods should be extended to 35 days. It is very responsive and somewhat dependent on applications of nitrogen during the growing season. Split applications of nitrogen (approximately 50 pounds per acre) after each grazing cycle or cutting are recommended. However, if only one application is possible, apply nitrogen in the spring at approximately 150-200 pounds per acre (Intermountain Planting Guide, 2001). Soils should be tested to determine precise fertilizer application rates.

Pests and Potential Problems

RS hybrid wheatgrass has shown moderate susceptibility to injury by the grass billbug *Sphenophorus parvulus* under ideal soil and moisture conditions for this insect (USDA-ARS, 1989).

Environmental Concerns

Although RS hybrid wheatgrass is morphologically distinct, its seed is similar in appearance to the quackgrass parent. Therefore, to avoid problems with noxious weed laws, the cultivar 'Newhy' was licensed under Title 5 of the Plant Variety Protection Act of 1970. Conditions of this protection specify that Newhy seed can be marketed only as a class of Certified seed (Asay, K.H., Horton, W.H. 1991).

Contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seed Production

Seed production of RS hybrid wheatgrass is very successful under cultivated conditions. For optimum seed production, seed should be drilled in 30 to 36 inch rows at 25-30 pure live seeds per foot of row. Application of fertilizer should be based on soil tests. Typically, new seedlings should not need fertilizer unless soil tests indicate deficiency of nitrogen, phosphorus and potassium. Mature seed production fields should be fertilized in the fall with 40 to 60 pounds of nitrogen per acre. Cultivate to maintain row culture and to control weeds. Follow instructions on labels when using herbicides for weed control. Seed yields range from 200 pounds per acre on dryland areas receiving 16 or more inches of annual precipitation to 400 pounds per acre on irrigated land.

Since seed maturity within a seedhead is variable, harvest the field when most of the seeds are mature. Windrowing is a good alternative to direct combining because it allows seed to mature more evenly. The crop should be windrowed about a week before seed maturity. If crop is direct-combined, set the platform high enough to cut the seed and as little green growth as possible. Seed should be dried immediately after direct-combining (Asay, Horton, 1991).

Cultivars, Improved, and Selected Materials (and area of origin)

'Newhy' was developed and released by the USDA-ARS in December, 1989 in cooperation with the Utah Agricultural Experiment Station and the USDA-SCS. Breeder and Foundation seed is maintained and produced by the USDA-ARS at Logan, Utah. It is an artificial hybrid of *Elymus repens* and *Pseudoroegneria spicata*. Because of the morphological similarity of Newhy seed to that of quackgrass, the variety has protection under the Plant Variety Protection Act of 1970. The conditions of the license specifies that Newhy seed can only be marketed as a class of Certified seed (USDA-ARS, 1989).

RS-H hybrid wheatgrass was developed and released in May, 2002 by the USDA-ARS in cooperation with the Utah Agricultural Experiment Station as Tested class Pre-variety Germplasm. RS-H is a natural hybrid and is cytologically similar to and is infertile with the cultivar Newhy but is less rhizomatous, taller in stature and has longer flag leaves than Newhy. Seed of RS-H is maintained by the USDA-ARS at Logan, Utah.

'AC Saltlander' was developed and released by Agriculture Canada, Prairie Agricultural Research Centre in Swift Current Saskatchewan in 2006 (Stephuhn et. al, 2006). A series of mass selection breeding cycles were performed on RS-H hybrid wheatgrass obtained from the USDA-ARS. Evaluations for resistance to root-zone salinity, winter hardiness, uniform plant color, plant vigor, leafiness, seed-set and freedom from plant pests were conducted. The resulting progeny has salinity tolerance equal to tall wheatgrass, *Thinopyrum ponticum*. A private seed company has exclusive rights to increase and market seed in Canada and the United States (AgCanada, 2010).

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