

TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE
PLANT MATERIALS - 5 SPOKANE, WASHINGTON SEPTEMBER, 2010

PLANT IDENTIFICATION

This Technical Note is a compilation of several old Technical Notes and various references.

Technical Note #5 is subdivided into the following Sections:

Section 5.1 Identification of Major Cereal Grains & Grassy Weeds

**Section 5.2 Identification of Willow Species Planted Along Streambanks in
Washington**

Section 5.3 Identification of Common Grasses in Eastern Washington

SECTION 5.1 Major Cereal Grains & Grassy Weeds

It goes without saying that it is very important to be able to correctly identify the major grains produced in Washington. This section provides several quick and easy tips that can be used to identify grains and 4 grassy weeds.

Wide Leaf Grains -

- Corn
- Sorghum
- Sudangrass & Hybrid Sorghum-Sudangrass

Small Grains -

- Wheat
- Triticale
- Six-row Barley
- Two-row Barley
- Oats

Grassy Weeds -

- Wild Oats
- Cheatgrass
- Jointed Goatgrass
- Rye

Wide Leaf Grains -

Corn is easy to identify. It is planted in late spring in rows that are typically 22-36" wide. It does not tiller at the base like small grain plants. The stalks are robust and frequently will have short exposed "brace" roots at the base that help support the plant. Leaves are smooth and glossy. **Leaf margins are smooth.**

Sorghum is similar to corn in the vegetative stage. It too is planted in late spring in rows. Mature plants are 8-13 feet tall. The leaves are wide and glossy. **Leaf margins are toothed.** Brace roots are lacking. Basal tillering is common. The seedhead is a panicle borne at the top of the plant.



Sorghum: note full panicle seed head. Photo courtesy of cramersfresh.com

Sudangrass & Hybrid Sorghum-Sudangrass are similar to sorghum. Sudangrass has narrower leaves and the stems are solid-pithy. Stems are about 1/4-inch in diameter. Mature sudangrass plants are 4-7 feet tall. Sudangrass is not common in Washington. As expected, the hybrid is intermediate in height.

Small Grains -

The small grains are easy to confuse but there are a few key descriptors that make identification a little easier.



White wheat head: note awns diverging from head. Photo courtesy of soilcrop.tamu.edu

Wheat leaves are smooth, hairless, and glossy. Profuse tillering at the base of the plant is very common. The auricles are short and hairy. Mature wheat fields are darker hued than barley fields.

Wheat heads vary considerably. White and red wheat have awns that diverge from the head. Club wheat has short, fat, compact heads. Club wheat doesn't have awns.

Triticale is a hybrid of wheat and rye. The seed looks like wheat seed with wrinkles. Triticale seed usually is not as plump as wheat seed. In the vegetative stage, wheat and triticale are difficult to differentiate. Triticale plants tend to lay flat during the early tillering stage. Wheat will have a mix of leaves and tillers that lay flat and stand up.



Triticale seed: note the seed's wrinkled appearance. Photo courtesy of the Plant and Soils Science Division of Oklahoma State University



Maturing barley: note long, smooth beard and light color. Photo courtesy of Syngenta

Barley can be differentiated from wheat by a couple characteristics. Barley auricles are bald, very prominent and clasp around the sheath. Mature barley fields are very light colored. Most barley varieties that are grown in Washington have awns. The awns (beards) are long, straight and 2-4 inches long. Awnless and hooded varieties are less common and are grown for hay. Awnless and hooded types have blunted-off, round-tipped awns that are $< \frac{1}{4}$ " long.

Two-row barley can be distinguished from 6-row barley by comparing the seedheads and the seed. Two-row barley will have a single kernel/spikelet and the kernels will all be uniform. Six-row barley will have three kernels/spikelet and 2/3 of the kernels will be slightly bent at the tip.

Oat leaves are waxy and take on a bluish cast. Oat leaves tend to be very upright. Auricles are completely absent and the ligule is prominent.

Oat heads are open panicles. The 1-2 kernels are borne at the end of each panicle terminus. Short-untwisted awns do occur on some varieties.

Mature oat fields are very light hued.



Oat: note upright position, open panicle and bluish hue. Photo courtesy of groworganicinfo.com

Grassy Weeds -

There are numerous grasses that are weeds. Four species are particularly troublesome and can be confused for cultivated grains.

Wild oats is a common weed in grain fields. Wild oats in the vegetative stage can be distinguished from cultivated grains by the shape of the leaf. When you look down at a wild oat plant, the leaves will be twisted counter-clockwise. Just remember, "counter-clockwise = counter productive", and you will be sure to not forget which way wild oats leaves twist.

Wild oat seed is borne on open panicles like its domestic cousin. Unlike cultivated oats, wild oat seeds will have dark, twisted and bent awns. Wild oat seeds will also have a distinctive "sucker mouth" at the base of the seed where it attaches to the rachis.



Cheatgrass is also known as downy brome in Washington. Cheatgrass typically germinates in late fall but can germinate in early spring. Leaves are very hairy on both sides. The seedhead is a panicle.

Mature Cheat Grass. Photo courtesy of jan.ucc.nau.edu/~plants



Jointed Goatgrass is a common weed in wheat fields. In the vegetative stage, Goatgrass and wheat are pretty similar except – jointed Goatgrass will have pronounced hairs on the sheath and leaf margins. Wheat sheaths and leaf margins are hairless (see photo).

Jointed Goatgrass seed heads are “tight cylinders” and only the upper spikelets will have awns (see photo).



Jointed Goatgrass seed: note the cylindrical seed shape. Photo courtesy of arizonacrop.org/weeds

Jointed Goatgrass. Photo courtesy of arizonacrop.org/weeds

Rye is both a weed and a cultivated crop. It is sometimes referred to as cereal rye. It is grown for seed and forage in parts of Canada and the Northeast United States, but it is not grown as a crop in Washington. Weedy rye is simply genotypes of cultivated rye that tend to shatter, hence its tendency to become weedy.

Rye occurs in winter wheat, winter barley, and waste areas. It germinates in the fall and tillers profusely. Mature plants are tall and seed ripens at about the same time as winter wheat.



Rye. Photo courtesy of stevensandsons.com

SECTION 5.2 Willow Species Commonly Planted Along Streambanks in Washington.

COMMON NAME <i>Sci.name</i> (<i>cultivars</i>)	Mature Leaf Characteristics					Height (ft)	Growth Form	Native Habitat and Range & WA (OR)	Remarks or Key Features
	Shape	Length vs width	Margin	Pubescence Above	Pubescence Below				
COYOTE or SANDBAR <i>Salix exigua</i> (<i>Silvar</i>)	linear, linear- elliptic lance- linear	7-15X	entire	dense	dense	6-20	open, upright leggy	E. of Cascades. Streambanks bottomlands	slender gray-green lvs, orangish twigs, thicket forming immediate to water's edge
COLUMBIA RIVER <i>S. fluviatilis</i> (<i>Multnomah</i>)	lanceolate lance-linear, linear-elliptic	5-15X	mod. serrate	sparse (appressed)	sparse (appressed)	6-20	compact, dense, upright	Banks of Columbia below Deschutes and lower ends of tribs	thicket forming, threatened species
HOOKER <i>S. hookeriana</i> (<i>Clatsop</i>)	obovate, broadly elliptic	1.5-3X	entire or wavy	sparse to mod.	dense, wooly	6-26	dense, upright, spreading	stable dunes, back waters, sloughs and streams w/in 5 miles of coast	young twigs very pubescent, lvs "leathery" and thick
SITKA <i>S. sitchensis</i> (<i>Pumas</i>)	elliptic, obovate, oblanceolate	2-4X	entire	moderate	dense, velvety	6-23	open, very upright	streams meadows west of Cascades, mntns of E. WA and Wallowas	leaves "satiny" (hairy) below with prominent veins
PURPLEOSIER <i>S. pupurea</i> (<i>Streamco</i>)	lanceolate, lance-linear linear-elliptic	4-10X	serrate above middle	none	none	10-20	upright to spreading	Introduced from Europe, lowlands	Red-purple twigs. Sterile male clone that does not root sucker
PACIFIC <i>S. lasiandra</i> (<i>Nehalem</i>)	lanceolate, narrowly elliptic	4-12X	finely serrate	sparse or none	none	6-30	upright shrub or small tree	Streambanks from sea-level to mid-elev	"peach leaves", tiny glands on upper surface of leaf blade
COTTET <i>S. X cotteti</i> (<i>Bankers</i>)	broadly elliptic with cordate base	2-3X	finely serrate	sparse or none	none	3-6	dwarf, spreading, decumbent	Introduced from Europe alpine areas	leaf stipules broad and prominent, spreads by layering

COMMON NAME <i>Sci.name</i> (cultivars)	Mature Leaf Characteristics					Height (ft)	Growth Form	Native Habitat and Range & WA	(OR)	Remarks or Key Features
	Shape	Length vs width	Margin	Pubescence Above	Pubescence Below					
ERECT <i>S. ligulifolia</i> (Placer)	ligulate, lanceolate, linear (oblong)	5-12X	serrate to nearly entire	sparse or none	none	3-16	open at base, upright to rounded	meadows, streambanks 3000- 9000', Sierra Nevada to Southern OR.		Part of the <i>S. rigida</i> complex
ARROYO <i>S. lasiolepis</i> Rogue	oblanceolate, obovate, elliptic	2-4X	serrate to entire	sparse or none	sparse or none	14-36	upright, spreading, sm tree	Western OR & WA		very rapid growth rate
PIPER <i>S. piperi</i>	oblanceolate, obovate, elliptic	2-4X	serrate to entire	sparse to none	sparse to none	6-10	upright, small to spreading	W of Cascades, below 500 feet. Ponds, swamps, streams		slower growing
MACKENZIE <i>S. rigida</i> (Rivar)	lanceolate, ovate- lanceolate	7-10X	serrate	none	none	5-20	Several- stemmed from base	Widespread below 5000 ft, adapted to many soils		Reddish-brown twigs, width-height proportional
DRUMMOND <i>S. drummondiana</i> (Curlew)		3-5X	entire		velvety	5-10	spreading shrub	Palouse region, Wallowa mtns		Bright yellow twigs, twice as wide as tall
LEMMON'S <i>S. lemmonii</i> (Palouse)		3-5X	entire	none	none	6-20	spreading shrub	E. of Cascades, W. of Rockies		Twigs are green, twice as wide as tall
GOLDEN <i>S. alba</i> var. <i>vitellina</i>	lanceolate	5-8X	serrate	none	glaucus	45-80	large non- native ornamental tree	E. of Cascades, moist draws, streambanks, ponds, farmsteads		Gold twigs that are brittle,

(several listed in Europe)

Plant Identification

Quick Visual Reference for Common Grasses in Eastern Oregon & Eastern Washington



1 Barley (*Hordeum vulgare*) - cereal grain; winter, or summer annual; usually with long awns (4-7 inches); well developed auricles.



2 Great Basin Wildrye (*Leymus cinereus*) - very big bunchgrass; native; coarse, robust culms, 2-8 ft tall; cylindrical shaped spike; 2-7 spikelets per node; usually on deep soils.



3 Bluebunch Wheatgrass, awnless (*Pseudoroegneria spicata*) - bunchgrass; native; the spike seedhead is well-staggered; one spikelet per node; auricles well developed, clasping, often reddish in color.



5 Cheatgrass (*Bromus tectorum*) – winter annual; hairy, turns purplish in spring; panicle of nodding spikelets; lemmas awned; introduced.



4 Bluebunch Wheatgrass, awned (*Pseudoroegneria spicata*) - same as above except lemmas have strongly divergent awns.



6 Bulbous Bluegrass (*Poa bulbosa*) – perennial; densely tufted; spikelets bulbiferous; culm bases bulbous; very early species; introduced.



7 Crested Wheatgrass (*Agropyron cristatum*) - bunchgrass; comblike, spike seedhead; introduced.



9 Jointed Goatgrass (*Aegilops cylindrica*) - annual; spike narrowly cylindrical; glumes and upper lemma awned; weed in winter wheat fields; introduced.



8 Meadow Foxtail (*Alopecurus arundinaceus*) - perennial with short rhizomes; dense bottlebrush-like panicle; >14 inch precipitation zone; introduced.



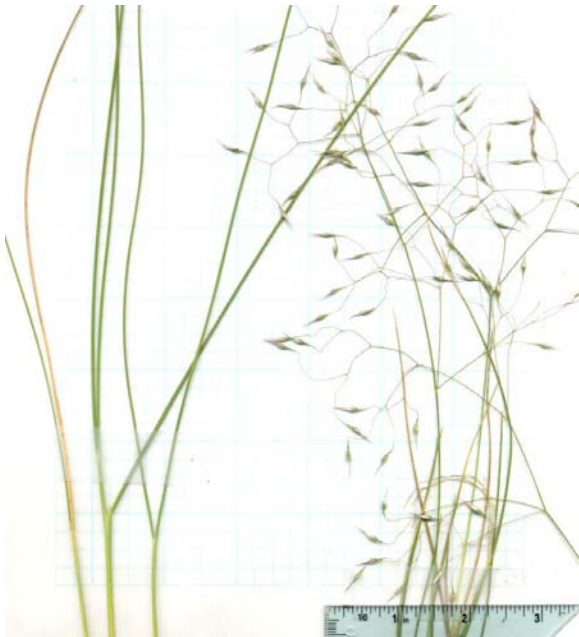
10 Idaho Fescue (*Festuca idahoensis*) - bunchgrass; native; stiff, fine, folded leaves; narrow panicle; lemmas awned;



11 Intermediate Wheatgrass (*Thinopyrum intermedium*) - rhizomatous perennial; spike seedhead is well staggered and lacks awns; glumes distinctly nerved and often blunt; pubescent wheatgrass is the same species and is similar in appearance except it is covered with short soft hairs; introduced.



13 Japanese Brome (*Bromus japonicus*) - annual; hairy; panicle open, nodding; awns strongly divergent at maturity; weedy; introduced.



12 Indian Ricegrass (*Achnatherum hymenoides*) - bunchgrass; native; very open panicle; one flowered spikelets at the end of long thin branches.



14 Junegrass (*Koeleria macrantha*) - bunchgrass; native; panicle contracted, not open, often with a space between the bottom spikelets.



15 Needle-and-Thread (*Hesperostipa comata*) - bunchgrass; native; open panicle; 1-flowered spikelets; lemmas with 4-8 inch long flexuous awns; seed bearing culms with prominent flag leaf.



16 One-Spike Oatgrass (*Danthonia unispicata*) – bunchgrass; native; relatively short grass (6-12 inches); dense, hairy foliage; short erect flower stalks and erect cauline leaf blades.



17 Orchardgrass (*Dactylis glomerata*) - bunchgrass; seedhead is a panicle; spikelets are crowded in dense one-sided clusters; leaf blades flat near the base; moist draws or irrigated fields



18 Quackgrass (*Elymus repens*) - strongly rhizomatous perennial; spike seedhead; leaves with widely spaced, unequally prominent veins; inner leaf surfaces usually somewhat hairy; lemmas often with short straight awns; introduced..



19 Reed Canarygrass (*Phalaris arundinacea*) - very tall, strongly rhizomatous perennial; seedhead is a dense panicle; moist areas, often along waterways; invasive.



21 Sand Dropseed (*Sporobolus cryptandrus*) – bunchgrass; native; open to partly enclosed panicle; 1 flowered spikelets; very small seeds; conspicuous tufts of hair at collars; usually on sandy or gravelly soils.



20 Russian Thistle (*Salsola iberica*) - stems green and purple or red striped; leaf blades succulent when young becoming hard with age; tap rooted; seedlings look like grass but cotyledons are in pairs and are round; weedy; introduced.



22 Sandberg bluegrass (*Poa secunda* subsp. *secunda*) – small bunchgrass; native; panicle; leaves 2-4 inches long with double midrib, leaf blade keeled at tip; greens up early in spring; often on shallow soils.



23 Sheep Fescue (*Festuca ovina*) & Hard fescue (*Festuca trachyphylla*) - bunchgrass; panicle; lemmas often with short awns; leaves are very stiff, fine, and pointed; tussock is very compact; introduced.



25 Sixweeks Fescue (*Vulpia octoflora*) – small annual native; panicle; lemmas with short awns.



24 Big Bluegrass (*Poa secunda*) - bunchgrass; native; more robust than Sandberg bluegrass; panicle longer than 3 inches, lemmas without awns; leaves are 6-12 inches long. Leaves have double midrib and are keeled at tip.



26 Smooth Brome (*Bromus inermis*) - strongly rhizomatous perennial; panicle, green to purplish; lemmas rounded over the midvein; leaves are broad, smooth, and have a "M" crinkled on them; can be weedy; introduced.



27 Squirreltail (*Elymus elymoides*) - bunchgrass; native; seedhead a spike; stiff long awns on glumes and lemmas; leaves prominently veined tapering to a fine point.



29 Timothy (*Phleum pratense*) – bunchgrass; appears to be rhizomatous; ottertail like seedheads; florets are white at the base; moist areas and irrigated fields; introduced.



28 Tall Wheatgrass (*Thinopyrum ponticum*) - very large bunchgrass; the spike seedhead is long and well staggered; glumes squared at the tips; very stout stems; introduced.



30 Ventenata (*Ventenata dubia*) - tufted annual grass; reddish-black nodes in May and June; long ligule; awns become twisted and bent as plant senesces; weedy; introduced.



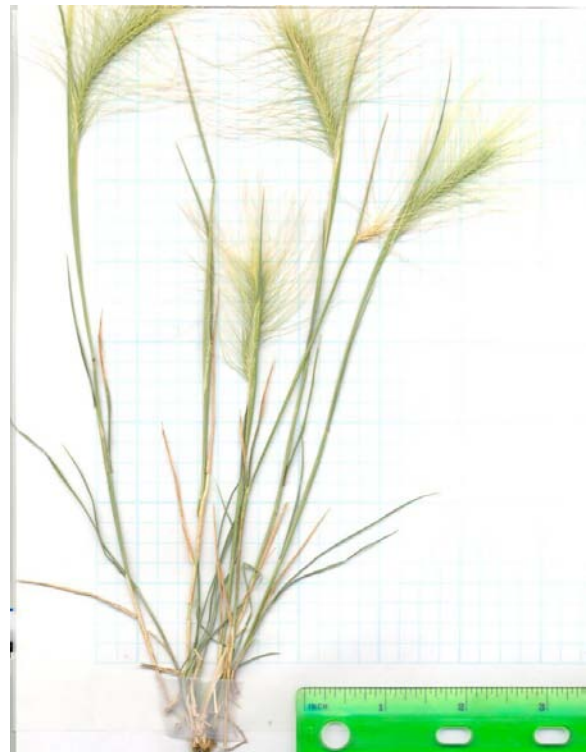
31 Kochia (*Kochia scoparia*) - annual forb; stems often reddish, soft-hairy, and round; leaves are alternate, lance-shaped, lower surface covered with soft hairs; weedy; introduced.



33 Wild Oats (*Avena fatua*) - annual; open panicle with nodding spikelets; twisted awns bend at right angles. Leaves often twisted counterclockwise; weedy; introduced.



32 Wheat (*Triticum aestivum*) - tufted annual; spike seedhead; large seeds and long awns.



34 Foxtail Barley (*Hordeum jubatum*) - bunchgrass; spike bottlebrush-like seedheads; lemmas and glumes are awned; at maturity breaks into 7 awn clusters; weedy; native.

References

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GRASS CATEGORIES BY IDENTIFYING CHARACTERISTICS

(by Kevin Guinn, NRCS Ephrata, Washington)

Seedhead is a spike or spike-like

Wheatgrasses
Wildryes
Prairie junegrass

Seedhead is a panicle

Brome-grasses
Fescues
Needlegrass
Tall oatgrass
Bluegrasses
Indian ricegrass
Sand dropseed

Awn from tip of lemma

Fescue

Awn from back of lemma

Brome-grasses

Has auricles

Wheatgrasses

Has ligules

Bluegrasses
Fescues
Needlegrass
Indian ricegrass
Prairie junegrass
Brome-grasses

Has both auricles and ligules

Wildryes
Tall Wheatgrass

Wide, coarse leaves

Basin wildrye
Tall wheatgrass

Narrow, rolled leaves

Fescue

Wide, soft leaves

Brome-grasses
Blue wildrye

Leaves folded, boat-tipped

Bluegrasses

With rhizomes

Smooth brome
Streambank wheatgrass
Thickspike wheatgrass

Small, usually inconspicuous clumps

Sandberg's bluegrass
Sheep fescue