

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE      NATURAL RESOURCES CONSERVATION SERVICE  
PLANT MATERIALS - 5      SPOKANE, WASHINGTON  
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## 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 ¼-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.



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.

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

Triticale is a hybrid of wheat and wheat seed with wrinkles. not as plump as wheat seed. In the and triticale are difficult to plants tend to lay flat during the Wheat will have a mix of leaves stand up.



rye. The seed looks like Triticale seed usually is vegetative stage, wheat differentiate. Triticale early tillering stage. and tillers that lay flat and

*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.



*Mature Cheat Grass. Photo courtesy of [jan.ucc.nau.edu/~plants](http://jan.ucc.nau.edu/~plants)*

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.



*Jointed Goatgrass. Photo courtesy of [arizonacrop.org/weeds](http://arizonacrop.org/weeds)*

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](http://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](http://stevensandsons.com)*

## SECTION 5.2 Willow Species Commonly Planted Along Streambanks in Washington.

COMMON NAME <i>Sci.name</i> (cultivars)	Mature Leaf Characteristics					Height (ft)	Growth Form	Native Habitat and Range (OR & WA)	Remarks or Key Features
	Shape	Length vs width	Margin	Pubescence Above	Pubescence Below				
<b>COYOTE or SANDBAR</b> <i>Salix exigua</i> (Silver)	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
<b>COLUMBIA RIVER</b> <i>S. fluviatilis</i> (Multnomah)	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
<b>HOOKER</b> <i>S. hookeriana</i> (Clatsop)	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

<b>SITKA</b> <i>S. sitchensis</i> (Plumas)	elliptic, obovate, oblanceolate	2-4X	entire	moderate	dense, velvety	6-23	open, very upright	streams meadows west of Cascades, mtns of E. WA and Wallowas	leaves "satiny" (hairy) below with prominent veins
<b>PURPLEOSIER</b> <i>S. pupurea</i> (Streamco)	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
<b>PACIFIC</b> <i>S. lasiandra</i> (Nehalem)	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
<b>COTTET</b> <i>S. X cotteti</i> (Bankers)	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
<b>ERECT</b> <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
<b>ARROYO</b> <i>S. lasiolepis</i>	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

Rogue

<b>PIPER</b> <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
<b>MACKENZIE</b> <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
<b>DRUMMOND</b> <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
<b>LEMMON'S</b> <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
<b>GOLDEN</b> <i>S. alba</i> var. <i>vitellina</i> (several listed in Europe)	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,



## SECTION 5.3 Common Grasses in Eastern Washington

An overly simplified guide for several grasses and “grass look-a-likes” that you will most likely encounter in CRP fields and pastures of Washington. Look at this Section as a work in progress.

1. **SALSIFY** - A broadleaf that resembles seedling grasses. Salsify will bleed white latex when you remove a leaf.
2. **RUSSIAN THISTLE** – Seedlings look like grass but the cotyledons are in pairs and the cotyledons are round rather than flat like a leaf blade. Also, the cotyledons will be equal length (3/4-3” long).
3. **DOWNY BROME (CHEATGRASS)** - The leaves are very hairy, decumbent, and have a purplish color in the spring; the heads are nodding and turn purple when mature.
4. **BLUEGRASSES** - have twin veins running down the midrib.
  - **CANADA BLUEGRASS** or **KENTUCKY BLUEGRASS** are rhizomatous; seedheads are very open (Note: do not expect to find these grasses occurring in dry upland sites that receive less than 14” MAP). Canada bluegrass stems remain green when seed is mature.
  - **SHERMAN BIG BLUEGRASS** - is a bunchgrass and the seedhead is longer than 3” long and fairly dense. The leaves are long (6-10”).
  - **SANDBERG BLUEGRASS** and **CANBY BLUEGRASS** - are bunchgrasses and the seedheads are sparse and fairly open. The leaves are short (2-4”) and usually dry-up by July 1<sup>st</sup>.
  - **BULBOUS BLUEGRASS** - has seeds look like short black orbs; the base of the leaves are round; swollen bulbs at the crown (Note: This species is very early).
5. **SMOOTH BROME** - highly rhizomatous; the seedhead is a panicle; leaves are broad, smooth and have a “M” crinkled on the leaf ; expect to find this plant in draws and moist north slopes.
6. **BLUEBUNCH WHEATGRASS** - bunchgrass; the spike seedhead is well-staggered and the awns are about 3/4” long, bent and point outwards.
7. **PUBESCENT WHEATGRASS** - the spike seedhead lacks awns and has dense wooly hairs over most of the seedhead structures; the plant has short rhizomes.
8. **CRESTED WHEATGRASS** - is almost always a bunchgrass; the spike seedhead looks like a two-sided comb with the spikelets coming off the rachis at about 45 degree angles; the seedhead is broad, flat, fairly short.
  - **SIBERIAN WHEATGRASS** - looks similar to Crested Wheatgrass but the angle of the spikelets is closer to 30 degrees and the flat seedhead is more slender and longer than Crested Wheatgrass.
9. **ORCHARDGRASS** - bunchgrass; the seedhead is a panicle; the spikelets are crowded in dense one-sided clusters (hence its other common name “cocks foot”); expect to find this plant in only in moist draws.
10. **INDIAN RICEGRASS** - bunchgrass; the seedhead is a very open panicle; the spikelets are at the tips of long thin branches and appear fringed with long dense hairs; the seed appear as dark miniture bulbs.



11. **HARD** and **SHEEP FESCUES** – bunchgrasses; the leaves are very stiff, fine, straight, tips are pointed, unfolding the leaves is very difficult; and the tussock is very compact and NOT red at the base.
12. **TALL WHEATGRASS** – very big bunchgrass; the spike seedhead is very long and well staggered; each spikelet will usually have more than 7 florets; rachis is serrated; glumes are rounded at the tip and ½ as long as the spikelet; culms are very stout.
13. **BASIN WILDRYE** – very big bunchgrass; the spike seedhead has less of a staggered appearance and will appear very round and compressed; the leaves are long and smooth, leaf color will vary from green to green-blue.
14. **INTERMEDIATE WHEATGRASS** – rhizomatous grass; spike seedhead is well staggered and lacks awns; culms are stout; lemmas are awnless; usually will have 5-7 florets/spikelet
  - **QUACKGRASS** is similar in appearance but the stand will be less dense; and the leaf sheath will be hairy; usually occurs in moist sites.
15. **THICKSPIKE WHEATGRASS** – rhizomatous; spike seedhead that is well staggered; few florets/spikelet; finer stems; the leaves are narrow; lemma has hairs.
16. **BEARDLESS WHEATGRASS** – bunchgrass; similar in appearance to bluebunch wheatgrass but seedhead lacks awns; fine stemmed.
17. **SLENDER WHEATGRASS** – bunchgrass; staggered spike seedhead; ligule is lacking; fine stemmed.
18. **MOUNTAIN BROME** – tall bunchgrass; panicle head; broad green leaves; sheath is hairy and closed to near the top; expect to find only in moist sites.
19. **TALL OATGRASS** – very tall bunchgrass; panicle head; volunteers from waste areas; big seeds that look like oats, common under black locust groves.
20. **SAND DROPSEED** – bunchgrass; occurs on sandy soils and highly compacted soils; panicle head with seeds frequently fully developed in the leaf sheath; very small seeded; late maturing; rarely gets taller than 18". One of the few grasses that tolerates hot-dry gravel along edges of paved highways.
21. **REED CANARYGRASS** – very tall rhizomatous grass; relatively-dense panicle head; invades from wet areas; pink rhizomes.
22. **TIMOTHY** – ottertail seedhead; appears to be rhizomatous but will have tuberous underground culms; when the head is bent the florets will be white at the base; occurs primarily in moist areas.
  - **CREEPING FOXTAIL** – very rhizomatous; very similar in appearance to Timothy; ottertail head and when the head is bent the florets will appear to be dark at the base; occurs in moist areas.
23. **NEEDLEANDTHREAD** – bunchgrass; panicle head with very long awns that are twisted at the base; seeds are dark slender and pointed at the end; seedbearing culms will have a prominent flag leaf; very early grass and occurs commonly on sandy soils.

## 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