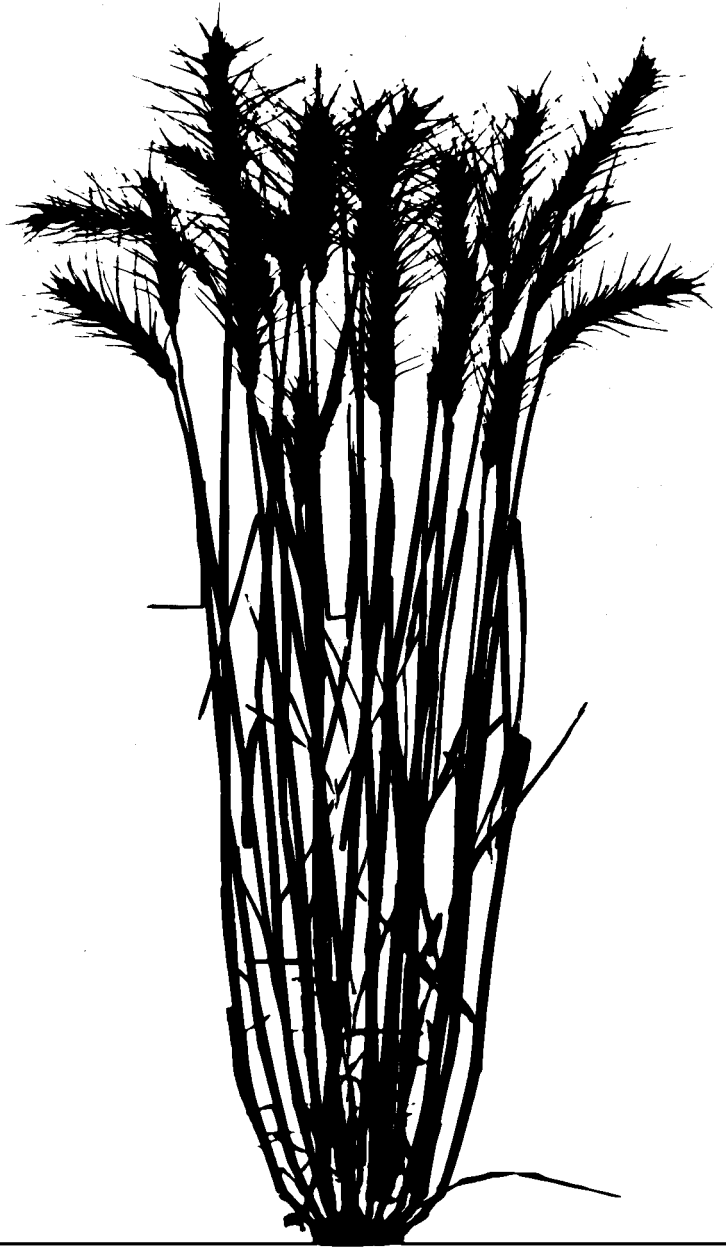


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Winter Wheat Varieties for 1989

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The purpose of this publication is to describe commonly grown soft white and hard red winter wheat varieties and to provide available yield and agronomic data to aid growers in variety selection. When selecting a variety, the following criteria should be considered:

Yield Potential. High yield is the bottom line in any production system. Yield potential varies from variety to variety and for a variety, from one area and from one year to another. Yield potential is a genetic trait but is moderated by other factors such as disease and stress tolerance. To evaluate the yield potential of a variety, review data from test sites with an environment similar to that in your area. Where possible, compare performance over several years as a single years data can be misleading.

Disease/Stress Resistance. Diseases are major problems across the state, however, type of disease and disease pressure varies from location to location and from year to year. Select a variety with resistance or tolerance to the diseases and stresses commonly found in your area.

Maturity. Early maturing varieties may avoid yield reductions and quality reductions caused by heat and or drought in mid-summer. Later maturing varieties may yield more when moderate temperatures and favorable moisture conditions persist into mid-summer; however, stem rust and other diseases favored by warm weather may become a problem.

Winter Hardiness. Winter hardiness is not a major limiting factor in winter wheat production in Oregon. Varieties with only an average level of winter hardiness perform successfully in most years. If winter kill is a major problem in your area, select varieties with a higher winter hardiness rating.

Grain Quality. Bushel weight (test weight) is a price determining factor in the market place. Choose varieties with good test weight records.

Agronomic characteristics, disease ratings, and yield data for commonly grown soft white and hard red winter wheats, and winter triticales are presented in tables 1, 2, and 3, respectively. Written descriptions of the most popular and/or newer varieties are given below.

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Soft Whites

BASIN is an awned, common-type soft white winter wheat released by Columbia Basin Seeds in 1985. It is rated as resistant to strip rust, leaf rust, common bunt, and flag smut, and as moderately resistant to dwarf bunt. It is a mid-season variety with good straw strength, winter hardiness, and emergence. The variety appears to be best adapted to high rainfall and irrigated situations.

CASHUP is an awned, common-type soft white winter wheat also released by Columbia Basin Seeds in 1985. It is similar in many respects to Basin, but has slightly better winter hardiness and is susceptible to dwarf bunt. Variety trial yield data are limited. The variety appears to be adapted across a broad range of environments.

CREW is a club wheat variety released by Washington State University (WSU). It is a multi-line variety containing ten similar wheat lines, each having a different level of resistance to stripe rust. As a whole, the variety has a good level of over all resistance. The variety is mid-season in maturity, has a mixture of brown and white chaff colors, and exhibits irregular height. Crew's yield potential in traditional club wheat growing areas is good.

DAWS is the most winter hardy of the soft white wheat varieties adapted to the Pacific Northwest. It is a mid-season, medium height, semi-dwarf developed by WSU. Emergence is only fair and the variety should not be planted where emergence from great depth is required.

DUSTY is a newer variety developed at WSU which has shown promise in yield trials across the Columbia Basin. It is more winter hardy than Stephens and has good emergence. It is a mid-late season variety and has resistance to many common diseases. Dusty is susceptible to *Cercospora* foot rot and powdery mildew. It has lodged under some irrigated production conditions. Grower experience with the variety is mixed.

HILL 81 is a semi-dwarf variety released by Oregon State University (OSU) in 1981. It has good emergence and winter hardiness. It is a mid-season variety with greater height than most semi-dwarfs and is susceptible to lodging when grown under intensive management. Yield potential is similar to Stephens. Hill 81 has shown tolerance to *Septoria* and to *Cephalosporium* stripe.

HYAK (WA 7166) is an awn-tipped, white chaffed, club wheat released by WSU in 1988. It is a backcross progeny of Tyee and resembles Tyee in physical appearance and in many agronomic traits, but is resistant to strawbreaker footrot and to stripe, leaf and stem rusts. Hyak is susceptible to powdery mildew, *Cephalosporium* stripe, common bunt and dwarf bunt. Yields have generally been equivalent to or better than those of Tres.

MADSEN (WA7163) is an awned, common soft white winter wheat with white chaff. It was released by WSU in 1988. Madsen is a backcross progeny of Hill 81 and is similar to Hill 81 in appearance and agronomic characteristics, but is resistant to strawbreaker footrot. Madsen has shown good field resistance to stripe, leaf and stem rusts. Madsen is equal in height to Hill 81 and slightly earlier in maturity. On average, yield is better than that of Hill 81, but less than that of Stephens.

MALCOLM is a high-yielding, semi-dwarf, common soft white wheat released by OSU in 1987. It has had superior yields to those of Stephens and other common varieties. It appears to be best adapted to irrigated areas of eastern and central Oregon, but has yielded well in other areas. Malcolm's resistance to *Cephalosporium* stripe and *Septoria* is similar to that of Stephens. Winter hardiness is fair.

OVESON is a common soft white wheat released by OSU in 1987. It is an awned, medium-tall semi-dwarf with white chaff. It has been similar in yield to Stephens, Hill 81, and other common varieties at some locations but significantly lower at others. Winter hardiness is similar to that of Stephens, while resistance to *Cephalosporium* stripe is greater. Heading date is similar to or slightly later than Hill 81.

STEPHENS is a high-yielding, widely adapted semi-dwarf released by OSU in 1977. It currently occupies more than 75% of the wheat acreage in Oregon. Stephens has only an average level of winter hardiness and is susceptible to *Cephalosporium* stripe. In areas where either of these problems occur frequently, it is recommended to not grow large acreages of Stephens, but to utilize varieties with better winter hardiness and *Cephalosporium* tolerance.

TRES is a club wheat variety released by WSU in 1984. Its name means three, signifying its resistance to three foliar diseases – stripe and leaf rust, and powdery mildew; however, it is no longer resistant to stripe rust races present in parts of Umatilla County. Tres is one of the ten component lines found in Crew. It appears to have a similar yield potential to Crew and is much more uniform in appearance.

Hard Reds

ANDREWS (WA6820) is a WSU developed hard red winter wheat released in 1987. It is a white-chaffed, awned, common-headed semi-dwarf with snowmold resistance and some TCK tolerance. Yields have been only average. Protein tends to be higher than that of Hatton.

BATUM is a white chaffed hard red winter wheat released by WSU in 1985. Batum is a semi-dwarf with shorter straw than Wanser or Hatton, and good lodging resistance. Emergence and winter hardiness may be slightly below that of other hard red winter wheats while yield potential is higher. Batum is susceptible to Dwarf Bunt, *Cercospora* foot rot and snow mold, but is resistant to stripe rust and has moderate resistance to leaf rust. It has good milling and baking quality but test weights are only adequate.

HATTON is a bearded hard red winter wheat released by WSU in 1979. It is best adapted to the lower rainfall areas of eastern Oregon where conditions may be suitable for production of higher protein grain. Hatton has good test weight and grain quality. It is medium height with good lodging resistance, but is susceptible to lodging when grown under intensive management. Hatton has a higher yield potential than Wanser.

Triticales

Triticales are wheat x rye hybrids grown primarily for feed. Winter, spring and facultative types are available. Newer varieties have yield potentials similar to wheat, but test weights are significantly lower. In most triticales, disease resistance is broader spectrum than that of wheats due to the rye background. Triticale is considered a non-program crop in USDA grain programs.

FLORA is a winter triticale released by OSU in 1986. Flora has excellent winter-hardiness and is resistant or tolerant of most wheat diseases with the exception of *Cephalosporium* stripe. Yield potential is excellent -- Flora has yielded as well or out yielded Stephens in many instances. Test weights are poor and kernels are shrunken.

WHITMAN (WA80011) is a facultative (spring-winter) triticale released by WSU in 1988. It has had adequate winter-hardiness to survive winters at Pullman, Washington, if snow cover is present during coldest weather. It is resistant to current races of stripe and leaf rust. Whitman is a tall triticale with good yield potential. Whitman heads out early, but is similar in harvest date to Daws or Nugaines. Test weights are only fair.

Table 1.-- Agronomic characteristics for commonly grown winter wheats

Variety	Released ¹		Emergence ² index	Winter- hardiness	Maturity	Height ³	Lodging ⁴ resistance	Test ² weight	Chaff ⁵ color	Head type
	Year	State								
Common white										
Basin ⁶	1985	Pr	6	6	midseason	SD-M	R	8	W	Awned
Cashup ⁶	1985	Pr	7	8	midseason	SD-M	R	8	W	Awned
Daws	1976	WA	4	8	midseason	SD-M	R	6	W	Awned
Dusty	1984	WA	5	5	mid-late	SD-M	MR	7	W	Awned
Hill 81	1981	OR	5	5	midseason	SD-MT	R	7	W	Awned
John	1984	WA	6	7	midseason	SD-M	R	7	W	Awned
Lewjain	1982	WA	6	6	late	SD-M	MR	7	W	Awned
Madsen	1988	WA	5	4	midseason	SD-MT	R	7	W	Awned
Malcolm	1987	OR	5	4	early-mid	SD-M	R	7	W	Awned
Nugaines	1961	WA	5	7	midseason	SD-M	R	8	W	Awned
Oveson	1987	OR	5	4	mid-late	SD-MT	MR	7	W	Awned
Sprague	1973	WA	6	7	early-mid	SD-M	MS	7	W-B	Awned
Stephens	1977	OR	5	4	early-mid	SD-M	R	7	W	Awned
Yamhill	1969	OR	7	4	midseason	MT-T	MR	7	W	Awnletted
Club										
Crew	1981	WA	6	5	midseason	SD-MT	MR	6	W-B	Awnless
Faro	1976	OR	6	5	early-mid	SD-MT	R	5	B	Awnless
Hyak	1988	WA	5	5	early-mid	SD-MT	MR	6	W	Awnletted
Jacmar	1978	Pr	5	7	early-mid	SD-M	R	5	B	Awnletted
Moro	1965	OR	8	5	early-mid	MT	MS	5	B	Awnless
Tres	1984	WA	5	5	midseason	SD-M	R	7	W	Awnletted
Tyee	1979	WA	5	6	midseason	SD-MT	R	5	W	Awnless
Hard red										
Andrews	1987	WA	5	7	early	SD-M	R	7	W	Awned
Batum	1985	WA	5	7	mid-late	SD-SM	R	6	W	Awned
Hatton	1979	WA	6	9	mid-late	MT	MR	8	W	Awned
Wanser	1965	WA	6	9	midseason	M	MS	8	B	Awned
Weston	1978	ID	6	8	early-mid	MT	R	8	-	Awned
Triticale										
Flora	1986	OR	6	9	early-mid	SD-SM	R	2	B	Awned
Whitman	1988	WA	5	4	midseason	MT	MR	2	B	Awned

¹ WA = Washington, OR=Oregon, ID=Idaho, Pr=Private

² Scale of 1 to 10, poor to excellent.

³ SD=semidwarf, SM=short-medium, M=medium, MT=medium-tall, T=tall.

⁴ R=resistant, MR=moderately resistant, MS=moderately susceptible.

⁵ W=white, B=brown.

⁶ Information provided by developer, Columbia Basin Seeds

Table 2.-- Disease ratings for commonly grown winter wheats

	Rust		Bunt		Flag smut	Cephalo- ¹ sporium	Sept- oria	Foot ² rot	Take all	Snow mold
	Stripe	Leaf	Common	Dwarf						
Common white										
Basin ³	R ⁴	R	R	MR	R	MR	--	--	--	--
Cashup ³	R	R	R	S	R	MR	--	--	--	--
Daws	MR	MS	R	S	MS	MS	MS	MS	S	S
Dusty	MR	MS	R	S	MS	MS	--	S	S	S
Hill 81	MR	MR	R	S	S	MR	MT	S	S	--
John	MS	S	S	S	--	--	--	--	S	R
Lewjain	R	MS	R	MR	MS	MR	MT	T	S	--
Madsen	R	R	S	S	--	MS	--	R	--	--
Malcolm	MR	MR	R	S	--	MS	MS	MS	S	S
Nugaines	MR	S	R	S	MR	MR	MS	MS	S	S
Oveson	R	S	MR	S	--	MR	--	MS	S	S
Sprague	S	S	S	S	S	S	--	S	S	R
Stephens	MR	MS	R	S	MS	S	MS	MR	S	S
Yamhill	MS	MR	S	S	MR	MS	MS	T	S	--
Club										
Crew ⁵	MR-S	MR	R	S	MS	S	--	S	S	--
Faro	S	S	MR	S	MS	S	MS	MS	S	--
Hyak	R	R	S	S	--	S	--	R	--	--
Jacmar	S	S	MR	MR	MS	MS	MT	T	S	--
Moro	MS	S	MR	R	MR	MR	--	MS	S	--
Tres ⁶	MR-S	MR	MR	S	S	S	--	MS	S	--
Tyee	S	S	MR	S	S	MR	--	T	S	--
Hard red										
Andrews	MR	S	R	MR	--	S	--	S	--	MR
Batum	R	MS	R	S	MS	MS	--	S	S	S
Hatton	MR	S	R	MS	--	--	--	S	--	S
Wanser	T	S	R	MR	--	--	--	--	--	MS
Weston	MS	MS	--	--	--	--	--	--	--	--
Triticale										
Flora	R	R	R	MR	--	S	R	MR	--	MR
Whitman	R	R	R	--	--	S	--	--	--	--

¹ Resistance to cephalosporium seems to vary with environment. Resistance may be due to morphological growth patterns rather than true genetic resistance.

² Cercospora foot rot.

³ Information provided by developer, Columbia Basin Seeds

⁴ R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible, T=tolerant, MT=moderately tolerant, -- = reaction unknown.

⁵ Crew is a multiline variety composed of ten separate lines, some of which are rust susceptible.

⁶ Tres is moderately resistant to powdery mildew. A stripe rust race in parts of Eastern Oregon and Washington has overcome Tres' stripe rust resistance.

Table 3.--Summary of yield data (60 lb. bushels per acre) for winter wheat varieties and a winter triticale tested at several locations in Oregon.

	<u>Arlington</u>		<u>Corvallis</u> ¹	<u>Hermiston</u>	<u>LaGrande</u>		<u>Madras</u>	<u>Moro</u>		<u>Ontario</u>	<u>Pendleton</u>	
	85-87	88	88	88	85-87	88	88	85-87	88	88	85-87	88
Basin	--	42	102	119	--	118	125	--	57	119	--	68
Cashup	--	45	99	105	--	121	133	--	52	104	--	76
Daws	38	42	--	--	81	121	--	42	64	--	84	76
Dusty	40	43	67	107	81	127	120	48	63	136	91	70
Hill 81	39	41	104	118	83	113	120	43	48	129	85	81
Lewjain	--	47	--	--	--	125	--	44	54	--	81	81
Madsen	--	47	--	--	--	121	(118)	--	57	--	--	79
Malcolm	39	40	87	125	77	125	140	43	68	139	85	82
Oveson	32	50	82	113	--	119	128	43	61	--	83	76
Stephens	41	48	85	126	71	111	135	44	65	140	83	81
Crew	38	42	71	90	78	115	108	43	54	--	83	70
Hyak	--	49	--	--	--	112	(104)	--	55	--	--	69
Tres	39	41	34	88	83	99	108	46	53	--	85	84
T/T/F/J ²	--	46	65	90	--	118	102	--	59	--	--	75
Andrews	--	41	78	92	--	104	112	--	45	--	--	70
Batum	--	48	78	60	--	109	100	38	68	--	72	74
Hatton	--	47	30	56	--	104	98	32	48	--	63	67
Wanser	--	44	25	59	--	93	88	30	38	--	60	57
Flora	--	43	105	102	--	115	124	--	64	--	--	72
Average	38	44	80/53	97	79	114	120/100	41	56	128	80	74
PLSD (5%)	4	NS	17/19	--	NS	17	12/18	10	13	--	11	9
CV	6	11	13/15	--	10	11	7/12	14	16	--	8	8

The figures given in this table are yield averages over the years 1985-87 and 1988 data. Levels of statistical significance are shown at the bottom of each column. Where two values are shown, the first is used for all white wheat comparisons and the second for red wheat yield comparisons. Data was obtained from trials conducted under the leadership of Pam Zwer, Matt Kolding and Warren Kronstad.

¹Corvallis trials are not sprayed for septoria control

²Four-way mixture of Tres, Tyee, Faro and Jacmar

³Varieties in () were not grown in the same trial but in one immediately adjacent. Data is shown for comparison only.

The Questions of Seed Quality

Seed Quality includes such factors as varietal identity, freedom from weed and other crop contaminants and the ability of the seed to germinate. State and federal seed laws require that seed offered for sale must be tested and truthfully labeled for these and other quality factors. When evaluating grain for seeding or when buying seed from off-farm sources, the following questions should be asked:

What is the identity of this seed? Varieties are developed with the goal of improving yields through disease resistance and improved agronomic characteristics. Seed Certification is one method of insuring varietal identity. Is the seed certified? Look for the "Blue Tag" or bulk shipping certificate verifying varietal identity. If the seed is uncertified, ask for information on how the seed was produced, what type of seed was used as seed stock, and what guarantee of varietal identity you can expect. Many varieties show local adaptation and varietal mixtures will not perform as well as pure varieties.

What is the pure seed percentage of this seed? Pure seed is the percentage of seed in the bag that is of the crop you are buying. A high percentage of pure seed will yield best results. For example, if a seed lot has a 99% pure seed, then, from a 100 lb. bag of seed you can expect 99 lbs. of pure seed of the specified crop.

What is the percentage of other crop seeds? Barley, oats, vetch, and other crop seed can be found in seed lots. The percentage of other crop seed tells you how much of the seed you are buying is of these other crops.

What is the inert matter content of this seed? Sand, stones, dirt, sticks, pods, chaff, and some broken seeds are all inert matter. These materials do not increase yield. A very low percentage of inert matter is preferable.

What is the weed seed percentage and what types of weeds are present in this seed lot? This percentage gives you an indication of the number of seeds of plants recognized as weeds that are present in the seed lot. A zero percentage is best; however, in many states there are allowances for certain types of weeds. There are also weed seeds which are strictly prohibited from being in seed. Remember that many weed seeds are very small, and a low percentage may still mean a high number of weed seeds are present.

What is the germination percentage of this seed? Percentage of germination is a measure of the number of pure seeds in a lot that will produce normal plants under favorable conditions. To be valid, the germination test for a seed lot must have been performed in the last 18 months for seed grown and sold in Oregon. Federal laws require germination tests within 5 months of sale for seed shipped across state lines. For the seed to be properly labeled, the date of test and germination percentage must both be stated. If you buy seed with a low germination, you are paying for dead seed.

These are the major questions to ask yourself or to ask a supplier when buying seed. If you have questions about seed laws, contact your local County Extension Office, your seed dealer, or the Oregon Department of Agriculture Commodity Inspection Division, Salem, Oregon.



Certified seed is your assurance of varietal purity, high germination, uniform quality, and freedom from noxious weeds. Look for the blue tag or the seed-certification shipping certificate, your guarantee of these qualities. Certified seed does not cost--it pays.

Call your local office of the OSU Extension Service for information on seed certification or to obtain Foundation Seed stock.

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