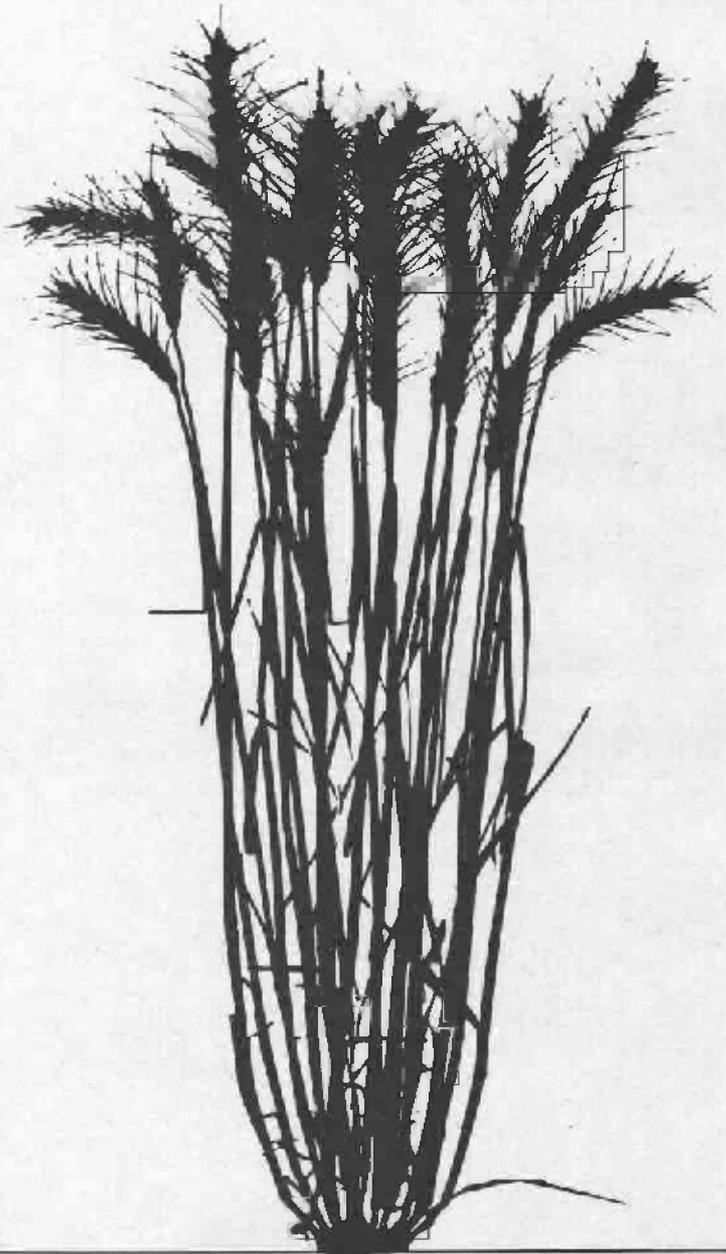


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Analytics

Winter Wheat Varieties for 1990

SR 775 / Revised June 1990



Winter Wheat Varieties for 1990

R.S. Karow and P.K. Zwer

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. 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/Pest/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. None of the currently grown varieties show resistance to Russian Wheat Aphid.

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 or consider use of a mixed variety planting.

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 triticals are presented in tables 1, 2, and 3-4, respectively. Detailed performance data can be

Russell S. Karow, Extension agronomist (cereals), Oregon State University; Pam Zwer, cereal breeder, Columbia Basin Ag Research Center.

obtained by contacting your nearest OSU Branch Experiment Station. 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.

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 multi-line club wheat variety released by Washington State University (WSU) in 1982. Small acreages are still being grown but it has been replaced by Tres and Hyak in many areas. Foundation seed will no longer be available.

DAWS is one of 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 common type soft white wheat variety released by WSU in 1985. It is more winter hardy than Stephens and has good emergence. It is a 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 awnletted, white chaffed, club wheat released by WSU in 1988. It is a backcross progeny of Tye and resembles Tye in physical appearance and in many agronomic traits, but is more 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 more 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. Like Stephens, Malcolm is susceptible to both *Cephalosporium* stripe and *Septoria*. 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.

STEPHENS is a high-yielding, widely adapted semi-dwarf released by OSU in 1977. It currently occupies approximately 70% 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 the Columbia Basin. Tres is one of the ten component lines found in Crew.

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.

HATTON is an awned 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 as 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		Emergence ² index	Winter- hardness	Maturity	Height ³	Lodging ⁴ resistance	Test ² weight	Chaff ⁵ color	Head type
	Year	State ¹								
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	1985	WA	5	5	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	1982	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	Septoria	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	MR	S	S	--
John	MS	S	S	S	--	--	--	--	S	R
Lewjain	R	MS	R	MR	MS	MR	MR	T	S	--
Madsen	R	R	S	S	--	MS	MR	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	MR	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	MR	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	R	--	--	--

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 and winter triticale varieties tested at several locations in Eastern Oregon.

	Arlington			Heppner			LaGrande			Moro			Pendleton		
	85-87	88	89	85-87	88	89	85-87	88	89	85-87	88	89	85-87	88	89
Basin	--	42	23	--	57	29	--	118	107	--	57	59	--	68	57
Cashup	--	45	19	--	51	22	--	121	116	--	52	65	--	76	53
Daws	38	42	18	36	56	26	81	121	107	42	64	62	84	76	58
Dusty	40	43	20	39	54	32	81	127	104	48	63	58	91	70	71
Hill 81	39	41	20	37	56	33	83	113	106	43	48	68	85	81	60
Lewjain	--	47	22	--	60	28	--	125	102	44	54	65	81	81	63
Madsen	--	47	21	--	52	31	--	121	97	--	57	60	--	79	66
Malcolm	39	40	21	39	57	32	77	125	108	43	68	60	85	82	72
Oveson	32	50	24	33	54	29	--	119	100	43	61	56	83	76	62
Stephens	41	48	21	39	64	33	71	111	104	44	65	59	83	81	61
Crew	38	42	16	31	52	26	78	115	97	43	54	61	83	70	61
Hyak	--	49	15	--	57	26	--	112	112	--	55	61	--	69	60
Tres	39	41	20	31	56	24	83	99	111	46	53	63	85	84	60
T/T/F/J ¹	--	46	19	--	54	24	--	118	90	--	59	60	--	75	61
Andrews	--	41	19	--	59	23	--	104	99	--	45	57	--	70	54
Batum	--	48	17	--	53	21	--	109	96	38	68	67	72	74	59
Hatton	--	47	20	--	55	23	--	104	92	32	48	53	63	67	61
Wanser	--	44	14	--	50	21	--	93	92	30	38	48	60	57	50
Flora	--	43	27	--	52	19	--	115	101	--	64	74	--	72	69
Whitman	--	--	24	--	--	26	--	--	118	--	--	51	--	--	68
Average	38	44	20	36	55	26	79	114	103	41	56	60	80	74	61
PLSD (5%)	4	NS	6	5	NS	NS	NS	17	NS	10	13	NS	11	9	6
CV	6	11	20	9	13	21	10	11	10	14	16	14	8	8	6

The figures given in this table are yield averages over the years 1985-87 and 1988 and 1989 data. Levels of statistical significance are shown at the bottom of each column. Data was obtained from trials conducted under the leadership of Pam Zwer, Columbia Basin Ag Research Center Cereal Breeder.

¹Four-way mixture of Tres, Tyee, Faro and Jacmar

Table 4. Summary of yield data (60 lb. bushels per acre) for winter wheat and winter triticales tested at a western Oregon and two irrigated sites.

Variety	Corvallis ¹		Hermiston		Madras	
	1988	1989	1988	1989 ²	1988	1989
Basin	102	--	119	--	125	--
Cashup	99	--	105	--	133	--
Daws	--	83	--	73	--	141
Dusty	67	112	107	72	120	124
Hill 81	104	97	118	55	120	109
Madsen	--	124	--	71	118	130
Malcolm	87	114	125	38	140	136
Oveson	82	109	113	78	128	117
Stephens	85	100	126	59	135	130
Crew	71	--	90	58	108	--
Hyak	--	127	--	55	104	--
Tres	34	96	88	68	108	--
T/T/F/J	65	96	90	87	102	--
Andrews	78	73	92	--	112	130
Batum	78	66	60	73	100	96
Hatton	30	47	56	76	98	76
Wanser	25	65	59	59	88	84
Flora	105	--	102	75	--	--
Whitman	--	114	--	--	--	128
Average	80/53	106/63	108/68	66/69	120/100	127/96
PLSD (5%)	17/19	14/18	--	--	12/18	--
CV	13/15	9/14	--	--	7/12	--

Levels of statistical significance, when available, are shown at the bottom of each column. The first figure (left column) is used for white wheat and triticale comparisons, the second for red wheats.

Data was provided by Dale Coats and Fred Crowe (Madras), Warren Kronstad (Corvallis), and Matt Kolding (Hermiston).

¹Not sprayed for Septoria control. There was heavy Septoria infestation in 1988, little in 1989.

²Severe cold in late January 1989 negatively impacted yields.

STATUS REPORT - club wheat mixtures

Most of the club wheat varieties grown in the PNW possess simply inherited resistance to stripe rust. Such resistance is easily overcome by the ever changing rust organism. Until club wheat varieties with more complex resistance can be bred, a procedure that can be used to "create" a rust resistant club wheat is to mechanically mix several otherwise susceptible varieties together. Data gathered by Dr. Chris Mundt over the past three years shows that as a mixture, susceptible varieties can be rust resistant. The table below shows percent rust data and relative yield for a Jacmar/Tyee mixture in comparison to each variety grown alone, both in the

presence and absence of rust. With rust present, the varietal mixture showed at least an 8% yield advantage over pure stands. Even in the absence of rust, the mixture showed a slight yield boost. Two words of caution - not all mixtures will show a similar response, certain varieties work better in mixtures than others, and in a severe rust year, mixtures may still need to be sprayed with fungicide. Mixtures may also be useful for controlling other diseases and for addressing production problems such as winter kill and frost damage at heading. If you would like more information on this practice, contact your local county extension agent.

Percent rust and relative yield of pure stand vs. a variety mixture.

Variety	Percent rust Pendleton 1989	Relative yield			
		Rust present		Rust excluded	
		Moro (2 yr. ave)	Pendleton (3 yr. ave.)	Moro (3 yr. ave.)	Pendleton (3 yr. ave.)
Jacmar	78	87	66	99	97
Tyee	69	88	92	99	98
Jacmar/Tyee	31	100	100	100	100

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.

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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