

# ORCF-102

## CLEARFIELD\* Soft White Winter Wheat

### Authors:

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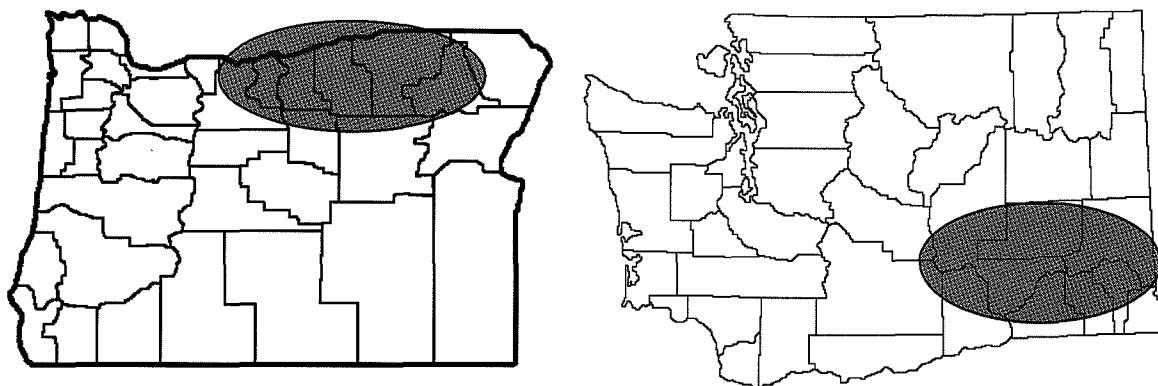
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### Variety Description:

'ORCF-102' is a common soft white winter wheat developed by Oregon State University and the BASF Corporation in cooperation with USDA-ARS. It is an awned, short-statured, semidwarf variety with high yield potential and midseason maturity. ORCF-102 is resistant to strawbreaker (eyespot) footrot, and current races of stripe rust. It is also moderately resistant to *Cephalosporium* stripe and *Fusarium* crown rot (dryland footrot). ORCF-102 is a non-GM wheat variety that carries a form of the acetolactate synthase (also known as acetohydroxyacid synthase) enzyme. The altered enzyme is not affected by imazamox, the active ingredient in Beyond™ herbicide and one of the active ingredients in Clearmax™ herbicide. When ORCF-102 is used in combination with Beyond™ or Clearmax™ at labeled rates, this CLEARFIELD\* technology provides growers with an effective tool for control of several grassy weeds.

### Area of Adaptation:



ORCF-102 is best adapted to the dryland and irrigated wheat growing regions in northeast Oregon and southeast Washington (blue shaded regions).

### Year Released:

ORCF-102 was released in 2004 and is protected under the Plant Variety Protection with the Title 5 option. ORCF-102 was released through Oregon State University's non-exclusive CLEARFIELD\* variety licensing program. Foundation and Registered seed

stocks may be sold only to those granted a license by OSU. Certified seed stocks may be used to plant a single commercial crop and may not be used to generate seed stocks for replanting. A signed BASF CLEARFIELD\* wheat stewardship grower agreement is required prior to purchasing seed for planting.

### **Agronomic Characteristics:**

#### ***Height and Lodging Resistance***

In trials over 22 site-years in Oregon and 37 site-years in Washington, ORCF-102 has averaged 36.3 and 36.2 inches, respectively. This is similar to Tubbs, Tubbs 06, and Eltan and approximately 2 to 3 inches taller than Stephens, Madsen, and ORCF-101 (Tables 1 and 2). Straw strength of ORCF-102 is good and lodging has not been observed in any production environment.

#### ***Maturity***

ORCF-102 is a mid-season maturing variety, similar to Tubbs, Tubbs 06, and ORCF-101. It heads approximately 2 days earlier than Madsen and 1 to 2 days later than Stephens (Tables 1 and 2).

#### ***Vernalization and Cold Tolerance***

ORCF-102 is a winter wheat that requires vernalization to initiate flowering. Results from crown freezing tests, a measure of cold tolerance, conducted by the USDA-ARS have shown that the cold tolerance of ORCF-102 is similar to Tubbs, Tubbs 06, Madsen, and Masami (Table 3). Under normal conditions growers in the northeast Oregon and southeast Washington are unlikely to observe winter injury during production of ORCF-102.

#### ***Disease Resistance***

ORCF-102 is resistant to strawbreaker (eyespot) footrot and current races of stripe rust. It is also moderately resistant to leaf rust, *Fusarium* crown rot (dryland foot rot) and *Cephalosporium* stripe. ORCF-102 is moderately susceptible to Septoria leaf blotch and snow mold. A seed treatment is recommended to control bunt and other seedling diseases (Table 3).

#### ***Yield***

ORCF-102 has been shown to have very high yield potential across a range of environments in Oregon and Washington. Across 34 site-years of OSU variety testing, ORCF-102 averaged 90.7 bushels per acre as compared to 90.4, 87.6, 85.8, 86.0, and 92.1 bushels per acre for Tubbs, Stephens, ORCF-101, Madsen, and Westbred 528, respectively (Table 1). Similarly, in 55 site-years of WSU variety testing ORCF-102 averaged 108.4 bushels per acre as compared to 110.4, 101.1, 101.3, 102.1, and 104.5 bushels per acre for Tubbs, Stephens, ORCF-101, Madsen, and Masami, respectively (Table 2). In northeast Oregon, where it is particularly well adapted, ORCF-102 averaged 83.6 bushels per acre, similar to Westbred 528 and Tubbs 06 (Table 1). In this region, ORCF-102 averaged 2 to 5 bushels per acre higher than Brundage 96, Goetze, Masami, and Stephens. Similarly, in southeast Washington south of Highway 2, ORCF-

102 averaged 110.2 bushels per acre, similar to Tubbs and 6 to 14 bushels per acre higher than Brundage 96, Eltan, Madsen, Masami, ORCF-101, Stephens, and Westbred 528 (Table 2).

#### ***Test Weight and Quality***

Test weight of ORCF-102 averaged 60.2 pounds per bushel across 24 site-years in Oregon and 59.9 pounds per bushel across 37 site-years in Washington. These test weights are similar Westbred 528. Test weight of ORCF-102 was approximately 1 to 1.5 pounds per bushel more than Brundage 96, Eltan, Madsen, Masami, ORCF-101, and Tubbs or Tubbs 06. Grain protein of ORCF-102 averaged 9.8% in Oregon and 11.3% in Washington similar to Stephens, Madsen, Tubbs or Tubbs 06, and Westbred 528.

Milling and baking evaluations from the Western Wheat Quality Laboratory and the Wheat Quality Council suggest that ORCF-102 is similar to Stephens and acceptable for a soft white winter wheat. Grain hardness values for ORCF-102 averaged 5 points higher than Stephens and 4 points less than Tubbs when measured with the Pertin Single Kernel Characterization System (SCKS). Average break flour yields were similar to Stephens and Tubbs. Cookie baking performance is similar to Stephens and average 0.13 centimeters wider cookie spread than Tubbs. Flour swelling volume tests suggest ORCF-102 has normal starch properties (Table 4).

#### ***Development***

ORCF-101 was derived from the three way cross 'Madsen'/'CV-9804'/'Weatherford' made in 1996 and 1997 at the OSU Hyslop Field Research Farm. CV-9804, also known as 'FS-4', is the donor of the Clearfield trait developed through mutagenesis of the cultivar 'Fidel'. ORCF-102 is an F<sub>2</sub> derived line, identified as a single plant in 1999 when it was selected from a bulk plot at the Columbia Basin Agricultural Research Center. The selection was evaluated under the experimental number OR2010007.

Breeder and Foundation seed will be maintained by Washington State Crop Improvement Association (WSCIA). ORCF-102 is protected under U.S. Plant Variety Protection with the Title 5 option (PVP 200500337). Certification classes recognized for ORCF-102 include Foundation, Registered and Certified. Certified seed will be produced and sold only under non-exclusive license with Oregon State University. Commercial growers may not retain seed for purposes of planting or replanting. Seed stocks that fail to meet certification standards can not be sold as seed, nor used as seed. Seed of ORCF-102 has been deposited in the USDA National Small Grains Collection, Aberdeen, Idaho. It is requested that the source of this material be acknowledged in future use by wheat breeding and genetics programs.

#### ***Acknowledgements***

Appreciation is extended to the Oregon Wheat Commission and BASF for financial support in the development of ORCF-102.

#### ***Variety Development Team***

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## **Management Guidelines:**

### ***Planting Date***

The disease resistance of ORCF-102 makes it a good choice for plantings across a wide range of dates in Oregon. In early plantings, the incidence of diseases such as *Fusarium* crown rot, strawbreaker (eyespot) foot rot, and *Cephalosporium* stripe as well as insect vectored diseases such as Barley Yellow Dwarf Virus increase. ORCF-102 is resistant or moderately resistant to many of these including; strawbreaker (eyespot) foot rot, *Fusarium* crown rot, and *Cephalosporium* stripe. Thus, ORCF-102 is a good choice for plantings prior to October 1. In September plantings, studies conducted in 2006 and 2007 found that the yield of ORCF-102 were similar to Tubbs or Tubbs 06 and 2 to 12 bushels per acre greater than Stephens, Madsen, ORCF-101, and Goetze (Table 5).

In “on-time” plantings ORCF-102 has shown high yield potential across a wide range of environment in Oregon and Washington. Plantings in early to mid-October are considered “on-time” for much of Oregon. In late plantings, yields of all varieties will be reduced compared to “on-time” plantings. However, ORCF-102 is a particularly good choice for late plantings. In late plantings, studies have shown that yields ORCF-102 are similar to Goetze, Tubbs or Tubbs 06 and 6 to 14 bushels per acre greater than ORCF-101, Stephens, and Madsen (Table 5). In addition to increased yield, ORCF-102 maintains higher test weight in late plantings compared to Stephens, Tubbs, Tubbs 06, Madsen, ORCF-101, and Goetze.

### ***Seeding Rate***

The recommended seeding rate for soft white winter wheat in Oregon is 22 seeds per square foot. For late planted wheat it is recommended that the seeding rate be increased to 33 seeds per square foot. Seeding rate trials have confirmed that these general recommendations are valid for ORCF-102. Increased seeding rates in late plantings resulted in a yield increase of 2 to 11 bushel per acre for ORCF-102 (Table 6).

Seeding rates for most equipment are adjusted in pounds per acre. To avoid heavy or light plantings, it is important to determine the proper seeding rate using the number of seeds per pound. Conversions for a range of seeds per pound are found in Table 7.

The number of seeds per pound depends on seed size and varies based on variety, production environment, and year. Research has shown the ORCF-102 has a high kernel

weight and the number of seeds per pound is similar to Stephens and greater than Tubbs or Tubbs 06. The seeds per pound may be obtained from your seed dealer or determined by weighing a 50-seed sample and using Table 7.

### ***Fertility***

ORCF-102 has been grown across a wide range of environments and no special fertility requirements have been observed. Therefore, it is recommended that growers follow the recommended fertility guidelines for soft white winter wheat in their area.

### ***Herbicide Applications***

Postemergence applications of Beyond™ or Clearmax™ may be made in the fall/winter or spring to ORCF-102 after tiller initiation but before jointing. Apply Beyond™ (imazamox) at a rate of 4-6 oz/acre of product (0.031 to 0.047 lb ai/acre) or Clearmax™ (imazamox + MCPA ester co-pack) at a rate of 4-6 oz/acre Beyond™ + 8-12 oz/a (0.23 to 0.35 lb ae/a) MCPA ester. Beyond™ and Clearmax™ applications require the addition of a nonionic surfactant (0.25 % vol/vol) and a liquid nitrogen fertilizer (2.5 gallons/100 gallons of spray solution) or ammonium sulfate solution (12-15 lbs/100 gallons of spray solution) to the spray mixture. Do not use crop oil concentrate or methylated seed oil surfactants when making Beyond™ applications to ORCF-102 or injury will result. Beyond™ may be applied in a liquid fertilizer carrier as long as the liquid fertilizer/water solution is at least 50 % water. Do not tank mix Beyond™ and Clearmax™ with Group 2 sulfonyleurea herbicides or unacceptable wheat injury may result. Review current Beyond™ and Clearmax™ labels for recommended tank mixture partners and mixing instructions.

Beyond™ and Clearmax™ will control or suppress many problem grass weed species in wheat production cropping systems including jointed goatgrass, downy brome, feral rye as well as many broadleaf weeds. Beyond™ or Clearmax™ should be applied to actively growing grass weeds in the 4-5 leaf stage and broadleaf weeds that are less than 3 inches tall. Refer to the weed control tables in the Beyond™ and Clearmax™ labels for more specific information on application timings, including fall timings, and recommended tank mixtures for specific problem weeds including feral rye, Italian ryegrass, wild oat and kochia. Further information on optimizing weed control utilizing CLEARFIELD\* technology may be found in:

PNW Weed Management Handbook.

Weed Management in Clearfield Wheat with Imazamox. EM 8833.

Available online at:<http://extension.oregonstate.edu>.

Table 9 lists the plant back restrictions for some common rotation crops that could follow ORCF-102 wheat in OR. Review the Beyond™ or Clearmax™ labels for the full list of crop rotational intervals before electing to plant and making applications of Beyond™ or Clearmax™ to ORCF-102 to insure that future crop rotation goals can be achieved. For some oilseed crops newer to the region, such as safflower or camelina, not currently listed on the labels and for which the plant back intervals have yet to be determined the plant back interval is likely greater than 18 months and may be as long as 26 months.

Herbicide resistance management is a key consideration when utilizing CLEARFIELD\* technology. Maintaining the utility of ALS-inhibiting Group 2 herbicides in wheat production cropping systems is crucial for increasing the longevity of this production technology. Thus, Oregon State University strongly advocates that growers follow the BASF stewardship recommendations outlined in the CLEARFIELD\* Wheat Stewardship Guide. These recommendations include:

- 1) Do not plant ORCF-102 or any other CLEARFIELD\* wheat variety continually and apply Beyond™ or Clearmax™ more than 2 out of every 4 years.
- 2) Limit the reliance on ALS-inhibiting herbicides and when applicable use herbicides with different modes-of-action.
- 3) Properly manage weeds in wheat-fallow-wheat rotations.
- 4) Treat the entire field with a labeled rate of Beyond™ or Clearmax™ for jointed goatgrass control.
- 5) Control jointed goatgrass in fencerows, road ditches, and pastures around CLEARFIELD\* wheat fields.

In addition, the following two publications outline some strategies for slowing or preventing the development of herbicide resistant weed populations:

Management Strategies for Preventing Herbicide-Resistant Grass Weeds in Clearfield Wheat Systems. PNW 572.

Available at: <http://info.ag.uidaho.edu/pdf/PNW/PNW0572.pdf>.

Herbicide-Resistant Weeds and Their Management. PNW 437.

Available at: <http://info.ag.uidaho.edu/pdf/PNW/PNW0437.pdf>.

There are no grazing or feeding restrictions of wheat forage following applications of Beyond™. Do not graze or feed wheat forage to meat or dairy animals for 7 days following applications of Clearmax™.

### ***Fungicide Applications***

A fungicide application is unlikely to be necessary when growing ORCF-102. However, no sensitivity to current fungicides are known. When applying fungicides, follow label directions and all applicable state and federal regulations.

### **Yield Components:**

Wheat yield can be broken down into three components; head number, kernels per head, and kernel weight. Both head number and kernels per head are determined early in wheat development, Feekes 2 – 5. Kernel weight is determined later in the growing season, Feekes 10.1 – 10.5. While environment plays an important role in yield determination, genetic factors heavily influence the way in which the three components combine to determine final wheat yield. In as such, total grain yield of ORCF-102 will be determined more by factors influencing head number and kernel weight more than head size and head fertility. Compared with widely grown varieties such as Tubbs and

Stephens, ORCF-102 can be characterized by average head numbers, a small head size, average head fertility, and high average kernel weights (Table 8).

**Table 1.** Grain yield and agronomic data for 11 soft white winter wheat varieties grown across a range of environments in Oregon.

Variety	Grain Yield				Agronomic Data			
	Northeastern Oregon		OWEYT		Test Weight	Grain Protein	Plant Height	Heading Date
	2-Year Mean	3-Year Mean	2-Year Mean	3-Year Mean	2-Year Mean	2-Year Mean	2-Year Mean	2-Year Mean
	16-Site Years	22-Site Years	24-Site Years	34-Site Years	24-Site Years	22-Site Years	22-Site Years	8-Site Years
	bu/ac	bu/ac	bu/ac	bu/ac	lbs/bu	%	in	DOY
ORCF-102	84.7	83.6	92.0	90.7	60.2	9.8	36.3	145.7
Brundage 96	80.8	81.1	88.8	89.0	59.1	9.5	33.2	145.4
Gene	71.5	76.1	78.0	83.3	57.9	10.5	30.4	141.6
Goetze	77.1	79.3	87.7	91.4	58.9	9.7	31.8	141.9
Madsen	75.9	77.0	84.9	86.0	59.2	10.3	34.1	147.5
Masami	81.7	80.8	89.6	88.9	58.7	9.4	35.8	148.7
ORCF-101	76.4	78.8	84.0	85.8	59.2	10.1	34.1	145.5
Stephens	77.0	79.0	86.6	87.6	59.0	10.1	33.7	144.3
Tubbs	80.6	80.3	89.8	90.4	58.7	9.6	36.7	146.1
Tubbs-06	82.2		91.8		58.8	9.6	37.0	145.7
Westbred 528	83.3	83.9	90.7	92.1	60.8	9.9	33.9	142.9
Mean	79.2	80.0	87.6	88.5	59.1	9.9	34.3	145.0
LSD (0.05)	3.2	2.7	3.2	2.6	0.4	0.3	0.6	0.7
CV (%)	10.3	9.9	11.2	10.8	2.1	7.0	4.9	0.9



**Table 2.** Grain yield and agronomic data for 10 soft white winter wheat varieties grown across a range of environments in Washington.

Variety	Grain Yield				Agronomic Data			
	WSU Variety Trials South of Highway 2		WSU Variety Trials		Test Weight	Grain Protein	Plant Height	Heading Date
	2-Year Mean	3-Year Mean	2-Year Mean	3-Year Mean	2-Year Mean	2-Year Mean	2-Year Mean	2-Year Mean
	30-Site Years	44-Site Years	37-Site Years	55-Site Years	37-Site Years	37-Site Years	37-Site Years	37-Site Years
	bu/ac	bu/ac	bu/ac	bu/ac	lbs/bu	%	in	DOY
ORCF-102	105.8	110.2	105.3	108.4	59.9	11.3	36.2	152.6
Brundage 96	99.5	103.1	101.7	103.8	58.5	11.1	33.3	152.5
Eltan	97.3	96.0	99.3	97.7	59.3	11.2	36.2	157.0
Madsen	98.2	103.0	98.4	102.1	59.1	11.6	34.6	154.9
Masami	101.7	104.3	102.0	104.5	58.1	10.9	35.3	156.4
ORCF-101	95.7	102.0	96.2	101.3	59.1	11.7	34.3	152.1
Stephens	98.0	102.5	97.7	101.1	58.9	11.4	32.8	150.6
Tubbs	107.5	111.2	107.5	110.4	58.5	10.8	36.1	152.5
Tubbs-06	102.9		103.7		58.3	11.1	36.4	153.1
Westbred 528	100.0	102.8	101.1	102.4	60.8	11.3	33.5	149.4
Mean	100.7	103.9	101.3	103.5	59.0	11.2	34.9	153.1
LSD (0.05)	2.7	2.4	2.4	2.1	0.2	0.2	0.4	0.3
CV (%)	10.7	11.0	10.5	10.9	1.7	6.8	4.7	0.8

**Table 3.** Agronomic and disease ratings for 12 soft white winter wheat varieties grown in Oregon and Washington.

Variety	Maturity	Winter Hardiness*	Rust†		Septoria†	Crown Rot†	Cephalosporium Stripe†	Strawbreaker Foot-Rot† <i>Pseudocercospora</i>
			Stripe	Leaf				
ORCF-102	Mid-Season	4	R/MR	MR	MS	MR/MS	MR/MS	R
Brundage 96	Mid-Season	5	MR	MS	S	MR	MR/MS	S
Eltan	Mid-Late	10						
Gene	Early	2	MR/MS	S	S	MR	MS	MS/MR
Goetze	Early-Mid	2	R	MR	MR	MR/MS	MS	MR
Madsen	Mid-Season	5	R	MR	MS	MR/MS	MR	R
Masami	Mid-Season	5	MS		S	MR	MR/MS	
ORCF-101	Mid-Season	3	MS	MS	MS	MS/MR	S	S
Stephens	Early-Mid	3	R	S	S	S	S	S
Tubbs	Mid-Season	5	MS	MS	MS	S	S	R
Tubbs-06	Mid-Season	5	MR/MS	MS	MS	S	S	R
Westbred 528	Early-Mid	4	MS	MS	S	MR	S	S

\* Scale: 1 to 10, with 10 being excellent and 1 being poor.

† Scale: R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible

Data is compiled from the following sources: Winter Grain Varieties for 2003, Special report 775, Oregon State University Extension Service; 2004 through 2007 Oregon Winter Elite Yield Trial Disease Ratings; and variety Characteristics, Washington State Crop Improvement Association.

**Table 4.** End-use quality analyses of ORCF-102 soft white winter wheat in paired comparisons with Stephens and Tubbs. Data provided by USDA-ARS Western Wheat Quality Lab.

Variety	Kernel Hardness	Break Flour Yield	Flour Yield	Flour Ash	Milling Score	Flour Protein	Mix Absorption	Cookie Diameter
	SKCS	%	%	%		%	%	mm
ORCF-102	42.3*	48.4	69.3	0.42	82.5	9.2	55.5	9.29
Stephens	35.9	48.1	69.9	0.42	83.6	9.7	55.8	9.28
ORCF-102	43.0	48.4	69.0	0.42	82.4*	8.7	55.8	9.34*
Tubbs	45.5	48.3	69.0	0.45*	80.5	8.6	55.7	9.21

\* indicates a statistically significant increase ( $p < 0.05$ ) based on a paired t-test.

**Table 5.** Grain yield of seven soft white winter wheat varieties in a planting date study at Pendleton Oregon in 2006 and 2007.

Planting Date	Variety								
	Stephens	Madsen	Tubbs	Tubbs-06	ORCF-101	ORCF-102	Goetze	Skiles	LSD <sub>(0.05)</sub>
	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac
	2006								
September 12	81.7	86.6	103.9		88.9	93.3	83.9		10.0
October 3	91.7	101.2	102.4		98.7	105.9	105.6		8.8
October 27	78.1	69.4	79.5		72.4	84.8	79.4		5.6
November 20	83.6	74.8	89.1		78.6	88.7	88.7		6.8
	2007								
September 12	81.7			83.3	82.1	84.1	80.7	78.9	11.5
October 3	80.9			76.7	79.9	75.5	84.5	82.0	12.2
October 27	70.9			72.0	66.9	66.7	71.1	72.7	10.7
November 20	48.0			62.2	49.0	57.8	62.1	55.0	7.1

**Table 6.** Grain yield of ORCF-102 across three seeding rates at Moro and Pendleton Oregon in 2007.

Planting Date	Seeding Rate (seeds/ft <sup>2</sup> )			
	11	22	33	LSD <sub>(0.05)</sub>
	bu/ac	bu/ac	bu/ac	bu/ac
	Moro			
October 3	83.6	94.7	92.1	13.8
October 27	68.4	73.1	71.3	19.2
November 20	57.2	60.6	71.6	11.6
	Pendleton			
October 3	78.9	83.0	77.8	8.4
October 27	65.9	71.2	73.0	6.9
November 20	51.1	52.2	63.6	6.2

**Table 7.** Seeding rate conversion from seeds per square foot to pounds per acre.

Seeds per Pound	Weight of 50 Seed Sample (g)	Seeding Rate (pounds/ac)	
		22 seeds/ft <sup>2</sup>	33 seeds/ft <sup>2</sup>
8,000	2.84	120	180
9,000	2.52	106	160
10,000	2.27	96	144
11,000	2.06	87	131
12,000	1.89	80	120
13,000	1.75	74	110
14,000	1.62	68	103
15,000	1.51	64	96

**Table 8.** Yield component comparison of ORCF-102, Stephens and Tubbs/Tubbs-06.

Yield Component	Variety Comparison
Head Number	ORCF-102 = Tubbs/Tubbs-06 < Stephens
Head Size	Stephens = ORCF-102 < Tubbs/Tubbs-06
Head Fertility	Tubbs/Tubbs-06 = ORCF-102 ≤ Stephens
Kernel Weight	Tubbs/Tubbs-06 < Stephens = ORCF-102

**Table 9.** Partial Listing of Rotational Crop Plant Back Intervals Following Beyond™ and Clearmax™ Applications

Plant Back Interval (Months)	Crop(s)
0	CLEARFIELD* Wheat, CLEARFIELD* Sunflower, CLEARFIELD* Canola, Dry Beans, Dry Peas
3	Alfalfa, Wheat (non- CLEARFIELD*)
4	Cereal Rye
8.5	Corn (CLEARFIELD* and non- CLEARFIELD* pop, sweet, field, and seed)
9	Barley <sup>1</sup> , Oat, Onion, Sunflowers, Peanut, Watermelon
18	Barley <sup>1</sup> , Carrot, Potato
26	Canola, Condiment Mustards, Sugar Beet, Table Beet

<sup>1</sup> See Beyond™ or Clearmax™ labels for soil pH, tillage system and cumulative rainfall and/or irrigation requirements that most closely approximate your production system to determine the appropriate barley plant back interval.

**Figure 1.** Picture of ORCF-102 wheat.

April 10, 2005

Additional Information for Oregon Seed Certification Variety Application for ORCF-102

1. Attached, please find a signed variety release notice: RELEASE OF 'ORCF-102' a CLEARFIELD\* SOFT WHITE WINTER WHEAT.

This notice contains information that summarizes:

- A. Origin and breeding history
- B. Botanical description of the variety
- C. Objective description of the variety
- D. Additional description of the variety, including identity and performance documentation.
- E. Area of Adaptation

2. Other information:

- F. Method for Production and Maintenance of Breeder Seed: See Below
- G. Voucher sample of seed: Will be submitted under separate cover.
- H. Variety Ownership Declaration Form: Enclosed.

Further descriptive information will be provided with a copy of the completed Application for Plant Variety Protection.

3. Method for Production and Maintenance of Breeder Seed:

Breeder seed was produced from the 2002 bulk harvest of headrows planted in 2001. Prior to harvest, heads were randomly selected and placed in storage for subsequent headrow breeder seed production. Heads will be randomly selected from each future headrow breeder seed production block for the life of the variety.

4. Variant Statement:

ORCF-102 May contain up to 5 red kernels per pound in Breeders, Foundation, Registered or Certified classes. ORCF-102 may also contain up to a total of 1 in 10,000 combined of the naturally occurring variants: Plants that are 8 to 15 cm taller or plants with bronze (red or tan) chaff spikes. These variants described are distinct within the variety and are stable and predictable with a degree of reliability comparable to other varieties of the same kind, and within recognized tolerances, when the variety is reproduced or reconstructed, and was originally part of the variety when released.

  
C. James Peterson

4-10-05  
Date