



# Xerpha

## Soft White Winter Wheat

WASHINGTON STATE UNIVERSITY EXTENSION • EB2043E

**Xerpha** is a new soft white winter wheat released by the Agricultural Research Center at Washington State University (WSU) in 2008. Xerpha is named in honor of WSU alumna, botanist, taxonomist, and weed scientist Xerpha Mae Gaines (1891–1970) who made lasting contributions to agriculture and science at WSU and in the Pacific Northwest (PNW). Xerpha is adapted to a broad range of production areas and consistently ranks among the top cultivars in all agronomic categories in the PNW. It was released as a replacement for Madsen and Eltan based on its high grain yield potential, test weight, cold tolerance, and high-temperature adult-plant resistance to local races of stripe rust.

### Variety Description

Xerpha is a semidwarf, soft white winter wheat cultivar with mid-season maturity and common head type, and with awns, white straw, and white chaff. Outstanding characteristics of Xerpha are consistent high grain yield, excellent test weight, cold tolerance and disease resistance.

### Origin and Development

Xerpha (WA007973) was derived from an Eltan/Estica cross, made in 1999 at the WSU Wheat Plant Growth Center. A greenhouse breeding technique known as ‘single seed descent’ was used to rapidly advance this line to its fifth generation in just two years. Thereafter a modified pedigree-bulk breeding method was used to advance the succeeding progeny in the field.  $F_{10}$ – $F_{12}$  generations were tested from 2005–2007 in the WSU Extension Uniform Cereal Variety Testing Program at multiple locations in Washington. Individual  $F_{12}$  heads (3,000) from Pullman were hand-threshed and separately planted in head rows in the fall of 2006 under irrigation at Othello, Washington, for breeder seed production. Those head rows were evaluated and selected for phenotypic uniformity, maturity, and resistance to disease. In 2007,  $F_{13}$  breeder seed was bulk harvested from the head row block and planted for foundation seed production.

### Area of Adaptation

Xerpha is unique in that it has very broad adaptation. It emerges and yields well under deep-furrow seeding in very dry conditions. It also performs extremely well in the intermediate and high precipitation zones of the PNW. Xerpha has a high tolerance to winter cold and drought conditions as well as strawbreaker foot rot and the current races of stripe rust.

### Agronomic Characteristics

#### *Yield and test weight*

Xerpha has been the top-yielding soft winter wheat variety in every precipitation zone in the WSU Extension Uniform Cereal Variety Testing Program trials from 2006 through 2008 where it was compared each year with 49 other varieties, breeding lines, and varietal blends from 10 other programs at 19 locations. Its three-year average yield in Washington was 111 bu/a as compared to 103 for Madsen and 98 for Eltan. It also has performed extremely well in variety testing programs in northern California, southern Idaho, and Oregon. Xerpha’s test weight is generally similar to Eltan and slightly less than Madsen (Table 1a).

#### *Height and lodging resistance*

Xerpha is similar in plant height to Eltan (36 in) and Madsen (Table 1a). Xerpha has strong straw strength. It has not lodged under irrigation and has had minimal lodging when grown in inoculated foot rot trials.

#### *Maturity and cold hardiness*

Xerpha heads two days earlier than Eltan and on the same date as Madsen (Table 1a). Growth chamber cold hardiness tests scored Xerpha as more cold tolerant than Madsen and equal to Eltan (Table 1b).

#### *Seed size and coleoptile length*

Xerpha has larger seed size than Madsen and Eltan, with coleoptile length similar to Eltan (Table 1b).

### Resistance to Pests

Xerpha has durable high-temperature, adult-plant resistance to stripe rust (Table 2). It is tolerant of *Cephalosporium* stripe,



Table 1a. Physical and agronomic characteristics of Xerpha.

Precipitation	Heading Date 2006–2008 Julian days to heading date			Plant Height 2006–2008 plant height (inches)			Grain Yield 2006–2008 yield as a percent of Madsen			Test Weight 2006–2008 test weight in lbs/bu		
	Xerpha	Madsen	Eltan	Xerpha	Madsen	Eltan	Xerpha	Madsen	Eltan	Xerpha	Madsen	Eltan
<16"	152	152	154	31.1	30.2	31.6	114	100	103	59.0	59.2	59.2
16–20"	157	157	159	38.6	37.2	38.9	111	100	97	59.6	59.6	59.8
>20"	165	165	167	38.3	37.5	38.7	114	100	104	58.8	58.5	58.7
Irrigated	149	150	150	37.3	36.7	37.7	103	100	90	59.5	59.4	58.3

Source: WSU Uniform Extension Cereal Variety Testing Program.

Table 1b. Additional physical and agronomic characteristics of Xerpha.

	Xerpha	Madsen	Eltan
Coleoptile length (mm)	69.4	66.8	71.5
<i>Source: Winter Wheat Program</i>			
Seed size: 1000kwt (g)	38.1	35.2	35.2
Cold hardiness index*	8	5	8
*1 = poor, 5 = medium, 10 = excellent			

Source: USDA-ARS Wheat Genetics, Quality, Physiology, and Disease Research Unit, Pullman, WA

comparable to Eltan and Bruehl which are the most tolerant commercial varieties in Washington. Snow mold resistance is significantly better than Madsen, but slightly less than Eltan. Inoculated field evaluations for foot rot disease show Xerpha has an elevated disease index level with minimal yield effect, indicating strong tolerance.

## Milling and Baking Characteristics

Xerpha displays acceptable grain, milling, and end-use quality, essentially equivalent to established varieties (Eltan, Madsen, Stephens, and Tubbs) and was assigned an "Acceptable" rating as evaluated by the USDA-ARS Western Wheat Quality Laboratory, Pullman, Washington.

## Availability of Seed

Foundation seed is available for commercial application (as of Fall 2008). Seed will be maintained by the Washington State Crop Improvement Association under supervision of the Department of Crop and Soil Sciences and the Washington State Agricultural Research Center. Application will be made for U.S. Plant Variety Protection (PVP) under

Table 2. Disease reactions of Xerpha.

Disease	Xerpha	Madsen	Eltan
Common Bunt	no data	R	MR
Dwarf Bunt	MR	MR	MR
Flag Smut	no data	MS	MS
Leaf Rust	no data	MR	S
Stripe Rust	MR	R	MR
Stem Rust	no data	R	S
Ceph. Stripe tolerance	5	5	6
Strawbreaker Foot rot	T	R	S
Snow mold	MR	S	MR

S = Susceptible; MS = Moderately Susceptible; MR = Moderately Resistant; R = Resistant; T = Tolerant; 1 = Poor; 5 = Medium; 10 = Excellent

Source: USDA-ARS Wheat Genetics, Quality, Physiology, and Disease Research Unit, Pullman, WA; WSU Department of Plant Pathology

Public Law 91-577. A seed sample has been deposited in the USDA-ARS National Center for Genetic Resources Preservation, where it will become available for distribution after expiration of PVP. Small quantities of seed for research purposes may be obtained from the corresponding author for at least five years from the date of this publication. Seed distribution for research purposes will be according to the provisions of the Wheat Worker's Code of Ethics.

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