Release of µUI Stone¶ 6 R I W : K L W H 6 S U L Q J : K H D W

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that is widely grown in the U.S. Pacific Northwest (PNW). The objective of this study was to develop a soft white spring (SWS) wheat cultivar with high grain yield, desirable end-use quality and resistance to *Fusarium* head blight [FHB; caused by *Fusarium graminearum* Schwabe; telomorph *Gibberella zeae* (Schwein.) Petch,] an emerging disease for spring wheat in southern Idaho and some areas in the PNW. µUI Stone¶ (Reg. No. CV------, PI 660550) SWS wheat was developed by the Idaho Agricultural Experiment Station using a modified backcross breeding procedure. UI Stone was derived from a backcross µPomerelle¶ (PI 592983)*2/ µTui¶ 8 Q N Q R Z Q in 1994 in Aberdeen, ID and tested under experimental numbers A94368B-7 and IDO599. UI Stone is being released due to its superior grain yield under non-irrigated and irrigated production conditions in southern Idaho and the PNW, its excellent end-use quality, and good resistance to FHB. UI Stone has better or equivalent flour

and break flour yield as well as cookie baking quality compared to widely grown cultivars µ$OWXUDV¶, µ$OSRZD¶ (PI 6...3), DQG µ8,3HWWLW¶ (PI 672063). Heading date of UI Stone is similar to the early maturity cultivar µNick¶ but is later than UI Pettit, and earlier than $OWXUDV µ/RXLVH¶ 3, FHB resistance of UI Stone was identified DQG µ$OSRZD¶ based on two field and three greenhouse experiments and two known molecular markers UMN10 and Xbarc117 associated with resistance gene Fhb1 and a QTL on chromosome 5AS, respectively. UI Stone has moderate resistance to stripe rust and might require fungicide application when severe epidemics occur. UI Stone has potential to be released with Plant Variety Protection (PVP) and as a licensed cultivar. UI Stone is the first released cultivar with resistance to FHB in the PNW.

INTRODUCTION

Fusarium head blight [FHB; caused by Fusarium graminearum Schwabe; telomorph Gibberella zeae (Schwein.) Petch], also called scab, is one of the most destructive diseases of wheat causing significant reductions in grain yield and quality. The development of resistant cultivars is an effective means of reducing the impacts of FHB. FHB has not been a serious problem for small grain production in southeastern Idaho. However, FHB epidemics occurred in sprinkler-irrigated wheat and barley fields in south central and eastern Idaho in 1982 and 1984, resulting in estimated yield losses as high as 50% (Mihuta-Grimm et al., 1989). Scab infection was also observed in wheat fields in southern Idaho in 2008 to 2011. In 2010 and 2011, high DON was identified in grain samples

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Pettit, and earlier W K D Q $ O W X U D V µ / R X L V H ¶ FHB, resistance of UI Stone $ O S R Z D

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METHODS

A94368S-SB-4,7,30, and 38 were selected and advanced in replicated preliminary yield trial in two locations Aberdeen and Tetonia in spring 1999. Two F_6 lines, A94368S-SB-7 and A94368S-SB-30 were selected and evaluated in the elite yield trials in four locations Aberdeen, Hazelton, Tetonia, and Moscow, ID in 2000 and 2001. A94368S-SB-7 was designated IDO599 in 2002 and entered into the tri-state trials in 2002 and the Western Regional Soft Spring Wheat Nurseries (WRSSWN) in 2003 and 2004.

Line Selection and Evaluation

IDO599 (UI Stone) has been officially evaluated since 2008 due to personnel changes in the breeding program from 2005 to 2007. Grain yield and agronomic performance of UI Stone were evaluated in the University of Idaho Spring Wheat Elite Yield Trials (UISWEYTs) in one rain-fed location (Moscow), and two irrigated locations (Hazelton and Aberdeen) in southern Idaho from 2008 to 2011, in the University of Idaho¶s State Extension Variety Trials (IDEVTs) in four irrigated locations (Rupert, Idaho Falls, Ashton, and Aberdeen) in southern Idaho from 2009 to 2011. Alturas, Alpowa, and UI Pettit were used as checks in the UISWEYTs and IDEYTs. UI Stone was simultaneously evaluated in the WRSSWNs from 2008 to 2010 at 11 locations each year across the states of Idaho, Oregon, Montana, and Washington. The cultivars Alpowa, Louise, Nick, and Alturas were used as checks in the WRSSWN trials.

Specifics of plot sizes, testing locations, evaluation methods and results for the WRSSWNs and the IDEVTs are documented at their web sites http://www.ars.usda.gov/Services/docs.htm?docid=3712 and (http://www.extension.uidaho.edu/cereals/), respectively.

The UISWEYTs consisted of three replicated plots planted in a randomized complete block design. Plots in 9m910T-5(5Tm [(-)] TJ ET B1 0 0 1535aET Bn)-11(g)10( )-c3645(e)4(d mpr [g)10(a

row plots. Ten spikes of each line were evaluated and the percentage of infected spikelets

End-Use Quality

Based on the baking data of five year-location environments in Hazelton and Aberdeen under irrigation in 2008-2010 (Table 4), UI Stone has good end-use quality for a soft white spring wheat. Flour protein of UI Stone (8.9%) was significantly higher than that of UI Pettit (8.5%), but not different from Alpowa (8.9%) and Alturas (8.8%). Flour yield (67%) and cookie diameter (8.7 cm) of UI Stone were similar to Alturas (66%

AVAILABILITY

Seed Source, Status and Availability: 400 heads were selected from a purificationplot grown at Aberdeen in 2009. Out of 400 headrows planted in Aberdeen in 2010, uniform headrows were harvested and bulked and used as breeder seeds. Ten pounds of the breeder seeds were planted in Tetonia, ID and Foundation seed was harvested in 2011. The Foundation, Registered, and Certified seed will be maintained and produced and distributed by the UI Foundation Seeds Program at Kimberly, ID. Small amounts (5g) of seed are available from the corresponding author for research purposes.

REFERENCES

*Different letters indicate significant differences among the five cultivars based on the LSD values.

Table 2 Grain yield, volume weight, days to heading, and plant height of UI Stone soft white spring wheat compared with check cultivars evaluated under irrigated conditions in the UISWEYTs in 2008, 2009, and 2010.

ID	Grain yield	Volume weight	Days to heading	Plant height
	Bu/A	Lb/Bu	d	In
IDO599	123.2	60.7	177.5	37.6
Alturas	124.9	60.5	178.6	37.1
Alpowa	115.7	61.0	179.1	38.7

Table 4. Quality characteristics of wheat cultivar UI Stone (IDO599) compared to three check cultivars from the 2008 to 2010 UISWEYTS.

Cultivar	IDO599	Alturas	Alpowa	UI Pettit	Mean of 19 entries	LSD (0.05)	No. of sites
			Milling and baking quality				
Flour protein (%)	8.9	8.8	8.9	8.5	9.0	0.1	5
Flour yield (%)	67.0	66.2	63.1	67.4	66.4	1.4	5
Break flour yield (%)	42.3	40.1	41.3	40.8	40.3	2.4	5
Flour ash (%)	0.35	0.36	0.36	0.36	0.40	0.01	5
Cookie diam. (cm)	8.7	8.6	8.5	8.8	8.6	0.2	5

Alkaline noodle dough initial color C q 87-5(.J24 17.16 re W* n BT 1 0 0 1 45%8050% 4!

Alturas	2	14	7	28	3	10
Mean	5	37	7	40	4	38
LSD (0.05)	3	23	3	19	2	26

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