

**2010**

**Uniform Bread Wheat Trial**

**Marker Report**

**Eatern Regional Small Grains Genotyping Lab**

**Collaborator: Gina Brown-Guedira**

**USDA-ARS**

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2010

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### Some details of notations in the Marker tables

"nd" = not determined or lack of amplification

If marker is dominant, samples with no amplification are left blank

"?" indicates that markers may not be diagnostic or data was not clear; therefore, can not be sure if gene is present or not

All numbers are size in base pairs of amplified fragments

Target alleles are in **bold** or *italics*

Rht1-B1b = dwarf = yes; Rht2-D1b = dwarf = yes

Ppd-D1a = photoperiod insensitive = yes

## 2010 Uniform Bread Wheat Trial

### Entry List

Nursery	Entry	Sample Name	Pedigree	Source
UBWT	1	AGS2000	Pioneer 2555/PF84301//Florida 302 (=PI612956; GA89482E7)	GA
UBWT	2	NC-Neuse	Coker 86-29//Stella/CHD756-80/3/Coker 9907 (=PI633037; NC96-13156)	NC
UBWT	3	Tribute	VA92-51-39/AL870365 (=VA98W-593)	VA
UBWT	4	Hondo	W84-179/W81-171/3/Sturdy/Hawk//Vona/W76-1141 (=PI603958; W95-210)	AgriPro
UBWT	5	Jagger	KS82W418/Stephens (=PI593688; KS84063-9-39-3)	KS
UBWT	6	Lakin	KS89H130/Arlin (=PI617032; KS96HW115)	KS
UBWT	7	TAM303	TX89D1253*2/TTCC404 (=WX93D208-9-1-2) (=TX98D1170)	TX
UBWT	8	Culpeper	Coronado/VBF0589-1	AgriPro
UBWT	9	Charter	MN72506/Thunderbird /4/ Mustang//TAM W-101/Roussalka/3/Hawk/Amigo	AgriPro
UBWT	10	Fannin	TX87V1613/KS91WGRC11	AgriPro
UBWT	11	ARS03-4736	KS00U755/TAM 303 (=WX02ARS113-9)	ARS
UBWT	12	ARS04-1267	KS98HW151-6/KS01HW101(01-6101) (=KS2135-U54)	ARS
UBWT	13	ARS05-0005	TX85-264*2/TTCC512	ARS
UBWT	14	ARS05-0043	TAM 303*2/TTCC365	ARS
UBWT	15	ARS05-0401	TAM 303*2/TTCC365	ARS
UBWT	16	ARS05-0403	TAM 303*2/TTCC365	ARS
UBWT	17	ARS05-0404	TAM 303*2/TTCC365	ARS
UBWT	18	ARS05-0241	Coker9835/RL6042//TX99D4657	ARS
UBWT	19	ARS05-1044	KS2132-U138/Trego (=WX03ARS1069-26)	ARS
UBWT	20	ARS05-1234	KS2016-U2/Lakin (=WX03ARS1080-19)	ARS
UBWT	21	ARS07-0004	TAM 302/TX99D4151	ARS
UBWT	22	ARS07-0024	TX99D4151/WX98D022-U44	ARS
UBWT	23	ARS07-0555	GA961565-27-6/TTCC255	ARS
UBWT	24	ARS07-0785	IN9712C1-4/PI434658	ARS
UBWT	25	ARS07-1105	WX98D011-U38/TX99D4657	ARS
UBWT	26	ARS07-1182	Trego/NC98-26143	ARS
UBWT	27	ARS07-1214	McCormick/Dominator	ARS
UBWT	28	ARS07-1243	NC00-14622/2137	ARS
UBWT	29	VA06HRW-3	VA97W-469[IN81401A1-32-2(Pm-Res)/ CK9803] / HEYNE=KS85W663-42,F10	VA
UBWT	30	VA06HRW-49	92PAN1 #33 / RENWOOD 3260"S" (VA97W-414),F10	VA
UBWT	31	VA06HRW-66	92PIN#109 / 92PAN1 #33,F10	VA
UBWT	32	VA06HRW-108	HEYNE (KS85W633-11-6-42) / RENWOOD 3260 (VA96-54-326= SC861562/CK9803) // 92PIN#135,F10	VA
UBWT	33	VA07HRW-45	PROVINCIALE / VISION 10 (92PAN2#26),F9	VA
UBWT	34	VA07HRW-97	92PAN1 #33 / 2137 // VISION 10 (92PAN2#26),F9	VA
UBWT	35	VA06HRW-43	92PAN1 #29 / RENWOOD 3260 [VA96-54-326=SC861562/CK9803],F10	VA
UBWT	36	VA08HRW-12	PAVON 76 (HMW 1D SUBUNIT 5+10: WS CIMMYT SPR. WHEAT) / PIONEER_2643 // VISION 10 (92PAN2#26),F9	VA
UBWT	37	VA08HRW-79	S.6742 / 92PAN1#33 // 92PIN#107,F8	VA
UBWT	38	VA08HRW-98	KS01HW54(94HW123-5/BTY SIB) / PROVINCIALE,F8	VA
UBWT	39	VA08HRW-103	KS01HW54(94HW123-5/BTY SIB) / PROVINCIALE,F8	VA
UBWT	40	VA08HRW-104	KS01HW54(94HW123-5/BTY SIB) / PROVINCIALE,F8	VA

**2010 Uniform Bread Wheat Trial**  
**Summary of all Markers**

Nursery	Entry	Sample Name	Rht1-B1b	Rht2-D1b	Rht8	Ppd-D1a
UBWT	1	AGS2000	no	<b>yes</b>	no	no
UBWT	2	NC-Neuse	no	<b>yes</b>	no	no
UBWT	3	Tribute	no	<b>yes</b>	no	no
UBWT	4	Hondo	<b>yes</b>	no	no	no
UBWT	5	Jagger	<b>yes</b>	no	no	no
UBWT	6	Lakin	<b>yes</b>	no	no	<b>yes</b>
UBWT	7	TAM303	<b>yes</b>	no	no	no
UBWT	8	Culpeper	nd	<b>yes</b>	no	<b>yes</b>
UBWT	9	Charter	no	<b>yes</b>	no	<b>yes</b>
UBWT	10	Fannin	<b>yes</b>	no	no	<b>yes</b>
UBWT	11	ARS03-4736	<b>yes</b>	no	no	nd
UBWT	12	ARS04-1267	<b>yes</b>	no	no	no
UBWT	13	ARS05-0005	<b>yes</b>	no	no	<b>yes</b>
UBWT	14	ARS05-0043	<b>yes</b>	no	no	<b>yes</b>
UBWT	15	ARS05-0401	<b>yes</b>	no	no	<b>yes</b>
UBWT	16	ARS05-0403	<b>yes</b>	no	no	<b>yes</b>
UBWT	17	ARS05-0404	<b>yes</b>	no	no	<b>yes</b>
UBWT	18	ARS05-0241	no	<b>yes</b>	no	nd
UBWT	19	ARS05-1044	<b>yes</b>	no	no	nd
UBWT	20	ARS05-1234	<b>yes</b>	no	no	no
UBWT	21	ARS07-0004	no	<b>yes</b>	no	no
UBWT	22	ARS07-0024	no	no	no	<b>yes</b>
UBWT	23	ARS07-0555	<b>yes</b>	no	no	no
UBWT	24	ARS07-0785	<b>yes</b>	no	no	<b>het</b>
UBWT	25	ARS07-1105	no	<b>yes</b>	no	nd
UBWT	26	ARS07-1182	no	<b>yes</b>	no	<b>yes</b>
UBWT	27	ARS07-1214	<b>yes</b>	no	no	no
UBWT	28	ARS07-1243	<b>yes</b>	no	no	nd
UBWT	29	VA06HRW-3	<b>yes</b>	no	no	no
UBWT	30	VA06HRW-49	no	<b>yes</b>	no	<b>yes</b>
UBWT	31	VA06HRW-66	no	<b>yes</b>	<b>yes</b>	<b>yes</b>
UBWT	32	VA06HRW-108	no	<b>yes</b>	no	<b>yes</b>
UBWT	33	VA07HRW-45	no	no	no	<b>yes</b>
UBWT	34	VA07HRW-97	no	<b>yes</b>	<b>yes</b>	<b>yes</b>
UBWT	35	VA06HRW-43	no	<b>yes</b>	no	<b>yes</b>
UBWT	36	VA08HRW-12	no	<b>yes</b>	no	<b>yes</b>
UBWT	37	VA08HRW-79	<b>yes</b>	no	no	<b>yes</b>
UBWT	38	VA08HRW-98	no	no	no	<b>yes</b>
UBWT	39	VA08HRW-103	no	no	no	<b>yes</b>
UBWT	40	VA08HRW-104	nd	no	no	<b>yes</b>

Rht1-B1b = dwarf = yes; Rht2-D1b = dwarf = yes      Ppd-D1a = photoperiod insensitive = yes

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**Summary of all Markers**

Nursery	Entry	Sample Name	Fhb1	Fhb Ernie 3Bc	Fhb 2DL-Wuhan1/W14	Fhb 5A Ernie	<i>Fhb 5A Ning7840</i>
UBWT	1	AGS2000	no	no	no	no	<i>no</i>
UBWT	2	NC-Neuse	no	no	no	?	<i>no</i>
UBWT	3	Tribute	no	no	no	no	<i>no</i>
UBWT	4	Hondo	no	no	no	no	<i>no</i>
UBWT	5	Jagger	no	no	no	no	<i>no</i>
UBWT	6	Lakin	no	no	no	no	<i>no</i>
UBWT	7	TAM303	no	no	no	no	<i>no</i>
UBWT	8	Culpeper	no	no	no	no	<i>no</i>
UBWT	9	Charter	no	no	no	no	<i>no</i>
UBWT	10	Fannin	no	no	no	no	<i>no</i>
UBWT	11	ARS03-4736	no	no	no	no	<i>no</i>
UBWT	12	ARS04-1267	no	no	no	no	<i>no</i>
UBWT	13	ARS05-0005	no	no	no	no	<i>no</i>
UBWT	14	ARS05-0043	no	no	no	no	<i>no</i>
UBWT	15	ARS05-0401	no	no	no	?	<i>no</i>
UBWT	16	ARS05-0403	no	no	no	no	<i>no</i>
UBWT	17	ARS05-0404	no	no	no	no	<i>no</i>
UBWT	18	ARS05-0241	no	no	no	no	<i>no</i>
UBWT	19	ARS05-1044	no	no	no	no	<i>no</i>
UBWT	20	ARS05-1234	no	no	no	<b>het?</b>	<i>no</i>
UBWT	21	ARS07-0004	no	no	no	no	<i>no</i>
UBWT	22	ARS07-0024	?	no	no	no	<i>no</i>
UBWT	23	ARS07-0555	no	no	no	no	<i>no</i>
UBWT	24	ARS07-0785	no	no	no	no	<i>no</i>
UBWT	25	ARS07-1105	no	no	no	no	<i>no</i>
UBWT	26	ARS07-1182	no	no	no	no	<i>no</i>
UBWT	27	ARS07-1214	no	no	no	no	<i>no</i>
UBWT	28	ARS07-1243	no	no	no	no	<i>no</i>
UBWT	29	VA06HRW-3	no	no	no	?	<i>no</i>
UBWT	30	VA06HRW-49	no	no	no	no	<i>no</i>
UBWT	31	VA06HRW-66	nd	no	no	no	<i>no</i>
UBWT	32	VA06HRW-108	no	no	no	no	<i>no</i>
UBWT	33	VA07HRW-45	no	no	no	no	<i>no</i>
UBWT	34	VA07HRW-97	no	no	no	<b>het?</b>	<i>no</i>
UBWT	35	VA06HRW-43	no	no	no	no	<i>no</i>
UBWT	36	VA08HRW-12	no	no	no	no	<i>no</i>
UBWT	37	VA08HRW-79	no	no	no	no	<i>no</i>
UBWT	38	VA08HRW-98	no	no	no	no	<i>no</i>
UBWT	39	VA08HRW-103	no	no	no	no	<i>no</i>
UBWT	40	VA08HRW-104	no	no	no	no	<i>no</i>

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**Summary of all Markers**

Nursery	Entry	Sample Name	Sr2	Sr36	Sr24/Lr24	Yr17/Lr37/Sr38	Lr34/Yr18/Pm38	Lr34-jagger	1RS	H13	H9	Bdv2/3
UBWT	1	AGS2000	no	no	no	no	no	no	<b>1RS:1BL</b>	no	no	no
UBWT	2	NC-Neuse	no	<b>yes</b>	no	no	no	no	non-1RS	no	no	no
UBWT	3	Tribute	no	no	<b>yes</b>	no	no	no	<b>1RS:1AL</b>	no	nd	no
UBWT	4	Hondo	no	no	<b>yes</b>	no	no	no	<b>1RS:1AL</b>	nd	nd	no
UBWT	5	Jagger	no	no	no	no	<b>false positive</b>	<b>yes</b>	non-1RS	no	no	no
UBWT	6	Lakin	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	7	TAM303	no	no	no	no	no	no	<b>1RS:1AL</b>	no	nd	no
UBWT	8	Culpeper	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	9	Charter	no	no	no	no	no	no	<b>1RS:1AL</b>	no	nd	no
UBWT	10	Fannin	no	no	no	no	no	no	<b>1RS:1AL</b>	no	nd	no
UBWT	11	ARS03-4736	no	no	no	no	no	no	<b>1RS:1AL</b>	no	no	no
UBWT	12	ARS04-1267	no	no	no	no	no	no	<b>1RS:1AL</b>	no	nd	no
UBWT	13	ARS05-0005	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	14	ARS05-0043	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	15	ARS05-0401	no	no	<b>yes</b>	no	no	no	<b>1RS:1AL</b>	no	no	no
UBWT	16	ARS05-0403	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	17	ARS05-0404	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	18	ARS05-0241	no	<b>yes</b>	no	no	no	no	<b>1RS:1AL</b>	no	no	no
UBWT	19	ARS05-1044	no	no	no	no	<b>yes</b>	no	<b>1RS:1AL</b>	no	nd	no
UBWT	20	ARS05-1234	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	21	ARS07-0004	no	no	no	no	<b>yes</b>	no	non-1RS	no	no	no
UBWT	22	ARS07-0024	no	<b>yes</b>	no	no	<b>yes</b>	no	non-1RS	no	no	no
UBWT	23	ARS07-0555	no	<b>yes</b>	no	no	no	no	non-1RS	<b>yes</b>	no	no
UBWT	24	ARS07-0785	no	<b>yes</b>	no	no	no	no	non-1RS	<b>yes</b>	no	no
UBWT	25	ARS07-1105	no	<b>yes</b>	no	no	no	no	non-1RS	no	no	no
UBWT	26	ARS07-1182	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	27	ARS07-1214	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	28	ARS07-1243	no	no	<b>yes</b>	<b>yes</b>	no	no	<b>1RS:1AL</b>	no	no	no
UBWT	29	VA06HRW-3	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	30	VA06HRW-49	no	<b>yes</b>	no	no	no	no	non-1RS	no	no	no
UBWT	31	VA06HRW-66	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	32	VA06HRW-108	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	33	VA07HRW-45	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	34	VA07HRW-97	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	35	VA06HRW-43	no	<b>yes</b>	no	no	no	no	non-1RS	no	no	no
UBWT	36	VA08HRW-12	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	37	VA08HRW-79	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	38	VA08HRW-98	no	no	no	no	no	no	non-1RS	no	no	no
UBWT	39	VA08HRW-103	no	no	<b>yes</b>	no	no	no	non-1RS	no	no	no
UBWT	40	VA08HRW-104	no	no	no	no	no	no	non-1RS	no	no	no

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**2010 Uniform Bread Wheat Trial**  
**Summary of all Markers**

Nursery	Entry	Sample Name	Bx7 over-expressing	Glu-D1	Glu-A1	dominant for hard allele			Texture
						pina	pinb D1a-b	pinb D1a-d	
UBWT	1	AGS2000	no	5+10	Ax2*	no	soft	soft	soft
UBWT	2	NC-Neuse	no	2+12	Ax1 or null	no	soft	soft	soft
UBWT	3	Tribute	no	5+10	Ax2*	no	soft	soft	soft
UBWT	4	Hondo	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	5	Jagger	no	5+10	Ax1 or null	hard	soft	soft	hard
UBWT	6	Lakin	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	7	TAM303	no	het	Ax2*	no	D1b/d	D1b/d	hard
UBWT	8	Culpeper	no	5+10	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	9	Charter	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	10	Fannin	no	5+10	Ax2*	hard	D1b/d	D1b/d	hard
UBWT	11	ARS03-4736	no	2+12	Ax2*	no	D1b/d	D1b/d	hard
UBWT	12	ARS04-1267	no	5+10	Ax2*	hard	soft	soft	hard
UBWT	13	ARS05-0005	no	2+12	Ax2*	hard	D1b/d	D1b/d	hard
UBWT	14	ARS05-0043	no	2+12	het	no	D1b/d	D1b/d	hard
UBWT	15	ARS05-0401	no	2+12	het	hard	D1b/d	D1b/d	hard
UBWT	16	ARS05-0403	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	17	ARS05-0404	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	18	ARS05-0241	no	2+12	Ax2*	no	D1b/d	D1b/d	hard
UBWT	19	ARS05-1044	no	2+12	Ax2*	no	D1b/d	D1b/d	hard
UBWT	20	ARS05-1234	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	21	ARS07-0004	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	22	ARS07-0024	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	23	ARS07-0555	no	?	het	no	D1b/d	D1b/d	hard
UBWT	24	ARS07-0785	no	5+10	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	25	ARS07-1105	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	26	ARS07-1182	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	27	ARS07-1214	no	5+10	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	28	ARS07-1243	no	2+12	Ax2*	no	D1b/d	D1b/d	hard
UBWT	29	VA06HRW-3	no	5+10	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	30	VA06HRW-49	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	31	VA06HRW-66	no	2+12	Ax2*	no	het?	soft	het?
UBWT	32	VA06HRW-108	no	2+12	het	no	D1b/d	D1b/d	hard
UBWT	33	VA07HRW-45	no	2+12	Ax2*	hard	soft	soft	hard
UBWT	34	VA07HRW-97	no	2+12	Ax2*	hard	soft	soft	hard
UBWT	35	VA06HRW-43	no	5+10	Ax2*	hard	soft	soft	hard
UBWT	36	VA08HRW-12	no	2+12	Ax1 or null	no	soft	soft	soft
UBWT	37	VA08HRW-79	no	5+10	Ax2*	no	D1b/d	D1b/d	hard
UBWT	38	VA08HRW-98	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard
UBWT	39	VA08HRW-103	no	2+12	Ax1 or null	hard	het?	soft	hard
UBWT	40	VA08HRW-104	no	2+12	Ax1 or null	no	D1b/d	D1b/d	hard

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**Dwarfing genes & Photoperiod insensitivity**  
2010

Nursery	Entry	Sample Name	Rht1K	Rht2K	Rht1-B1b	Rht2-D1b	gwm261	gwm261	Rht8	Ppd	Ppd	Ppd-D1a
UBWT	1	AGS2000	Allele X	<b>Allele Y</b>	no	<b>yes</b>	201		no		414	no
UBWT	2	NC-Neuse	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no		414	no
UBWT	3	Tribute	Allele X	<b>Allele Y</b>	no	<b>yes</b>	201		no		414	no
UBWT	4	Hondo	<b>Allele Y</b>	Allele X	<b>yes</b>	no	210		no		414	no
UBWT	5	Jagger	<b>Allele Y</b>	Allele X	<b>yes</b>	no	210		no		414	no
UBWT	6	Lakin	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	7	TAM303	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no		414	no
UBWT	8	Culpeper	nd	<b>Allele Y</b>	nd	<b>yes</b>	210		no	<b>283</b>		<b>yes</b>
UBWT	9	Charter	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no	<b>283</b>		<b>yes</b>
UBWT	10	Fannin	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	11	ARS03-4736	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	nd		nd
UBWT	12	ARS04-1267	<b>Allele Y</b>	Allele X	<b>yes</b>	no	210		no		414	no
UBWT	13	ARS05-0005	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	14	ARS05-0043	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	15	ARS05-0401	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	16	ARS05-0403	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	17	ARS05-0404	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	<b>283</b>		<b>yes</b>
UBWT	18	ARS05-0241	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no	nd		nd
UBWT	19	ARS05-1044	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	nd		nd
UBWT	20	ARS05-1234	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no		414	no
UBWT	21	ARS07-0004	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no		414	no
UBWT	22	ARS07-0024	Allele X	Allele X	no	no	195		no	<b>283</b>		<b>yes</b>
UBWT	23	ARS07-0555	<b>Allele Y</b>	Allele X	<b>yes</b>	no	173		no		414	no
UBWT	24	ARS07-0785	<b>Allele Y</b>	Allele X	<b>yes</b>	no	173		no	<b>283</b>	414	<b>het</b>
UBWT	25	ARS07-1105	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no	nd		nd
UBWT	26	ARS07-1182	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no	<b>283</b>		<b>yes</b>
UBWT	27	ARS07-1214	<b>Allele Y</b>	Allele X	<b>yes</b>	no	173		no		414	no
UBWT	28	ARS07-1243	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163		no	nd		nd
UBWT	29	VA06HRW-3	<b>Allele Y</b>	Allele X	<b>yes</b>	no	201		no		414	no
UBWT	30	VA06HRW-49	Allele X	<b>Allele Y</b>	no	<b>yes</b>	173		no	<b>283</b>		<b>yes</b>
UBWT	31	VA06HRW-66	Allele X	<b>Allele Y</b>	no	<b>yes</b>	<b>192</b>		<b>yes</b>	<b>283</b>		<b>yes</b>
UBWT	32	VA06HRW-108	Allele X	<b>Allele Y</b>	no	<b>yes</b>	173		no	<b>283</b>		<b>yes</b>
UBWT	33	VA07HRW-45	Allele X	Allele X	no	no	173		no	<b>283</b>		<b>yes</b>
UBWT	34	VA07HRW-97	Allele X	<b>Allele Y</b>	no	<b>yes</b>	<b>192</b>		<b>yes</b>	<b>283</b>		<b>yes</b>
UBWT	35	VA06HRW-43	Allele X	<b>Allele Y</b>	no	<b>yes</b>	173		no	<b>283</b>		<b>yes</b>
UBWT	36	VA08HRW-12	Allele X	<b>Allele Y</b>	no	<b>yes</b>	163		no	<b>283</b>		<b>yes</b>
UBWT	37	VA08HRW-79	<b>Allele Y</b>	Allele X	<b>yes</b>	no	163	173	no	<b>283</b>		<b>yes</b>
UBWT	38	VA08HRW-98	Allele X	Allele X	no	no	173		no	<b>283</b>		<b>yes</b>
UBWT	39	VA08HRW-103	Allele X	Allele X	no	no	173		no	<b>283</b>		<b>yes</b>
UBWT	40	VA08HRW-104	nd	Allele X	nd	no	210		no	<b>283</b>		<b>yes</b>

Rht1-B1b = dwarf = yes; Rht2-D1b = dwarf = yes

Ppd-D1a = photoperiod insensitive = yes

"nd" = not determined or lack of amplification

If marker is dominant, samples with no amplification are left blank

"?" indicates that markers may not be diagnostic or data was not clear; therefore, can not be sure if gene is present or not

All numbers are size in base pairs of amplified fragments

Target alleles are in **bold or italics**

**FHB QTLs**  
**2010**

Nursery	Entry	Sample Name																			Fhb
			umn 10	gwm 533	gwm 533	Fhb1	gwm 285	gwm 285	wmc 612	wmc 612	wmc 612	wmc 307	wmc 307	wmc 1	wmc 1	wmc 418	wmc 418	wmc 471	wmc 471	Ernie 3Bc	
UBWT	1	AGS2000	236	118		no	226		287	289		<b>141</b>		149		271		177	215	no	
UBWT	2	NC-Neuse	236	118		no	221		287	289		143		162		271		177	219	no	
UBWT	3	Tribute	236	nd		no	219		279	281		<b>141</b>		162		271		179	217	no	
UBWT	4	Hondo	236	nd		no	237		283	<b>285</b>		<b>141</b>		156		<b>262</b>		217		no	
UBWT	5	Jagger	236	nd		no	221		277	279	282	<b>141</b>		160		<b>262</b>		177	217	no	
UBWT	6	Lakin	236	118		no	219	221	279	281		143		156		269		177	217	no	
UBWT	7	TAM303	236	nd		no	226		277	279	282	<b>141</b>		160		<b>262</b>		177	217	no	
UBWT	8	Culpeper	236	nd		no	221		271	273		nd		151		271		177	215	no	
UBWT	9	Charter	236	118		no	226		279	281		<b>141</b>		160		269		177	217	no	
UBWT	10	Fannin	236	nd		no	226		275	277		<b>141</b>		160		269		177	217	no	
UBWT	11	ARS03-4736	236	nd		no	226		277	279		<b>141</b>		160		269		177	217	no	
UBWT	12	ARS04-1267	236	118		no	219		277	279		<b>141</b>		160		269		177	217	no	
UBWT	13	ARS05-0005	236	nd		no	237		283	<b>285</b>		<b>141</b>		156		269		177	217	no	
UBWT	14	ARS05-0043	236	nd		no	237		281	283	<b>285</b>	<b>141</b>		156		271		177	217	no	
UBWT	15	ARS05-0401	236	nd		no	226		283	<b>285</b>		<b>141</b>		156		271		177	217	no	
UBWT	16	ARS05-0403	236	118		no	219	237	273	283	<b>285</b>	141	143	151	156	<b>262</b>	271	177	217	no	
UBWT	17	ARS05-0404	236	nd		no	237		283	<b>285</b>		<b>141</b>		156		271		177	217	no	
UBWT	18	ARS05-0241	236	118		no	226		277	279		<b>141</b>		160		269		177	217	no	
UBWT	19	ARS05-1044	236	128		no	221		nd			<b>141</b>		160		169		177	217	no	
UBWT	20	ARS05-1234	236	nd		no	219		277	279		<b>141</b>		161		269		177	217	no	
UBWT	21	ARS07-0004	236	118		no	219		275	277	<b>285</b>	141	143	151		271		177	217	no	
UBWT	22	ARS07-0024	<b>239</b>	nd		?	222		279	281		143		157		271		177	215	no	
UBWT	23	ARS07-0555	236	118		no	221		<b>285</b>	287		143		151		271		177	215	no	
UBWT	24	ARS07-0785	236	118		no	221		271	273		143		151		271		177	215	no	
UBWT	25	ARS07-1105	236	118		no	226		277	279		<b>141</b>		160		269		177	217	no	
UBWT	26	ARS07-1182	236	118		no	219		275	277		143		151		271		177	215	no	
UBWT	27	ARS07-1214	236	118		no	226		277	279		<b>141</b>		160		269		177	217	no	
UBWT	28	ARS07-1243	236	118		no	219		279	281		<b>141</b>		162		271		179	217	no	
UBWT	29	VA06HRW-3	229	146	155	no	226		287	289		143		149		269		177	221	no	
UBWT	30	VA06HRW-49	236	118		no	219		275	277		143		151		271		177	215	no	
UBWT	31	VA06HRW-66	nd	nd		nd	219		275	277		nd		nd		271		177	215	no	
UBWT	32	VA06HRW-108	236	118		no	226		287	289		143		162		271		177	215	no	
UBWT	33	VA07HRW-45	236	nd		no	221		273	275		143		151		271		177	215	no	
UBWT	34	VA07HRW-97	236	118		no	221		271	273		143		151		271		177	215	no	
UBWT	35	VA06HRW-43	236	118		no	226		279	281		143		162		271		177	221	no	
UBWT	36	VA08HRW-12	236	128		no	226		277	279		<b>141</b>		151		271		<b>260</b>		no	
UBWT	37	VA08HRW-79	236	118		no	219		277	279		<b>141</b>		161		269		177	217	no	
UBWT	38	VA08HRW-98	236	nd		no	219	221	<b>285</b>	287		<b>141</b>		<b>153</b>		260		177	219	no	
UBWT	39	VA08HRW-103	236	nd		no	217		<b>285</b>	287		<b>141</b>		<b>153</b>		260		177	217	no	
UBWT	40	VA08HRW-104	236	nd		no	219	237	283	<b>285</b>	287	<b>141</b>		156		<b>262</b>		177	217	no	

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All numbers are size in base pairs of amplified fragments

Target alleles are in **bold or italics**

**FHB QTLs**  
**2010**

Nursery	Entry	Sample Name	cf	fd	gwm	gwm	gwm	Fhb 2DL- Wuhan1 /W14	gwm	gwm	wmc	wmc	wmc	barc	barc	barc	barc	Fhb 5A Ernie	Fhb 5A Ning 7840
			233	233	539	539	608		304	304	705	705	705	117	117	186	186		
UBWT	1	AGS2000	286	288	137		158	no	198		160	162		217		<b>203</b>		no	<i>no</i>
UBWT	2	NC-Neuse	286	288	133		150	no	<b>220</b>		<b>135</b>			<b>221</b>		<b>203</b>		?	<i>no</i>
UBWT	3	Tribute	<b>276</b>	278	133		150	no	198		160	162		217		<b>203</b>		no	<i>no</i>
UBWT	4	Hondo	272	274	131		154	no	213		133			224		<i>212</i>		no	<i>no</i>
UBWT	5	Jagger	274	<b>276</b>	131		<b>152</b>	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	6	Lakin	274		<b>125</b>		150	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	7	TAM303	274		<b>125</b>		156	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	8	Culpeper	274		<b>125</b>		154	no	221		139			<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	9	Charter	<b>276</b>	278	137		158	no	199		135			217		<b>203</b>		no	<i>no</i>
UBWT	10	Fannin	<b>276</b>	278	141		154	no	221		139			<b>221</b>		<b>203</b>		no	<i>no</i>
UBWT	11	ARS03-4736	278	280	135		150	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	12	ARS04-1267	<b>276</b>	278	135		<b>152</b>	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	13	ARS05-0005	<b>276</b>	278	139		170	no	199		141			217		<b>203</b>		no	<i>no</i>
UBWT	14	ARS05-0043	<b>276</b>	278	141		170	no	199		141			217		<b>203</b>		no	<i>no</i>
UBWT	15	ARS05-0401	271	272	131		154	no	<b>220</b>		<b>135</b>			<b>221</b>		<b>203</b>	<i>212</i>	?	<i>no</i>
UBWT	16	ARS05-0403	286	288	137		170	no	199		139	141		217	<b>221</b>	<b>203</b>	<i>212</i>	no	<i>no</i>
UBWT	17	ARS05-0404	280	282	141	144	170	no	<b>220</b>		<b>135</b>			<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	18	ARS05-0241	274		139		156	no	198		162	164		217		<b>203</b>		no	<i>no</i>
UBWT	19	ARS05-1044	<b>276</b>	278	137	141	156	no	199		<b>135</b>			217		<b>203</b>		no	<i>no</i>
UBWT	20	ARS05-1234	<b>276</b>	278	141		158	no	199	<b>220</b>	<b>135</b>	137	166	217	<b>221</b>	<b>203</b>	214	het?	<i>no</i>
UBWT	21	ARS07-0004	271		133		156	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	22	ARS07-0024	274		139		156	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	23	ARS07-0555	274		139		150	no	212	<b>220</b>	139	166		<b>221</b>		<b>203</b>		no	<i>no</i>
UBWT	24	ARS07-0785	274		141		150	no	201		139			217	<b>221</b>	<b>203</b>		no	<i>no</i>
UBWT	25	ARS07-1105	274		139		nd	no	198		162	164		217		<b>203</b>		no	<i>no</i>
UBWT	26	ARS07-1182	268		137		150	no	198		135	164	166	217	<b>221</b>	<b>203</b>		no	<i>no</i>
UBWT	27	ARS07-1214	<b>276</b>	278	137		156	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	28	ARS07-1243	nd		nd		150	no	212		160	162		<b>221</b>		<i>212</i>		no	<i>no</i>
UBWT	29	VA06HRW-3	nd		nd		<b>152</b>	no	<b>220</b>		<b>135</b>			<b>221</b>		<b>203</b>		?	<i>no</i>
UBWT	30	VA06HRW-49	nd		nd		150	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	31	VA06HRW-66	nd		nd		150	no	nd		133	162	164	217		<b>203</b>		no	<i>no</i>
UBWT	32	VA06HRW-108	nd		nd		150	no	198		164	166		217		<b>203</b>		no	<i>no</i>
UBWT	33	VA07HRW-45	<b>276</b>		131		158	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	34	VA07HRW-97	274		124		158	no	199	<b>220</b>	133	<b>135</b>		217	<b>221</b>	<b>203</b>		het?	<i>no</i>
UBWT	35	VA06HRW-43	nd		178		150	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	36	VA08HRW-12	272	274	135		154	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	37	VA08HRW-79	263		<b>125</b>		<b>152</b>	no	199		133			217		<b>203</b>		no	<i>no</i>
UBWT	38	VA08HRW-98	263		<b>125</b>		<b>152</b>	no	197		139			217		<i>212</i>		no	<i>no</i>
UBWT	39	VA08HRW-103	263		<b>125</b>		<b>152</b>	no	198		160			217		<b>203</b>		no	<i>no</i>
UBWT	40	VA08HRW-104	263		<b>125</b>		<b>152</b>	no	197		139			217		<i>212</i>		no	<i>no</i>

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Target alleles are in **bold or italics**

## Leaf, Stripe & Stem Rusts

2010

Nursery	Entry	Sample Name	Sr2	wmc		barc				Sr24/ Lr24	ventriup	Yr17/ Lr37/ Sr38	CsLv34	Lr34/Yr18/ Pm38	Lr34jagger _TaqMan	Lr34 - jagger
				477	Sr36	71	71	71	71							
UBWT	1	AGS2000	no	163	no	107	112			no		no	235	no	Allele X	no
UBWT	2	NC-Neuse	no	<b>185</b>	<b>yes</b>	100	104			no		no	235	no	Allele X	no
UBWT	3	Tribute	no	165	no	82	<b>87</b>	100	104	<b>yes</b>		no	235	no	Allele X	no
UBWT	4	Hondo	no	167	no	82	<b>87</b>	92	100	<b>yes</b>		no	235	no	Allele X	no
UBWT	5	Jagger	no	165	no	100	104			no		no	<b>154</b>	<b>false positive</b>	<b>Allele Y</b>	<b>yes</b>
UBWT	6	Lakin	no	165	no	100	104			no		no	235	no	Allele X	no
UBWT	7	TAM303	no	167	no	92	100	104		no		no	235	no	Allele X	no
UBWT	8	Culpeper	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	9	Charter	no	165	no	92				no		no	235	no	Allele X	no
UBWT	10	Fannin	no	163	no	100	104			no		no	235	no	Allele X	no
UBWT	11	ARS03-4736	no	167	no	100	104			no		no	235	no	Allele X	no
UBWT	12	ARS04-1267	no	167	no	100	104			no		no	235	no	Allele X	no
UBWT	13	ARS05-0005	no	167	no	82	<b>87</b>	100	107	<b>yes</b>		no	235	no	Allele X	no
UBWT	14	ARS05-0043	no	167	no	82	<b>87</b>	100		<b>yes</b>		no	235	no	Allele X	no
UBWT	15	ARS05-0401	no	167	no	82	<b>87</b>	100	107	<b>yes</b>		no	235	no	Allele X	no
UBWT	16	ARS05-0403	no	167	no	82	<b>87</b>	100	107	<b>yes</b>		no	235	no	Allele X	no
UBWT	17	ARS05-0404	no	167	no	82	<b>87</b>	100	108	<b>yes</b>		no	235	no	Allele X	no
UBWT	18	ARS05-0241	no	<b>185</b>	<b>yes</b>	107	112			no		no	235	no	Allele X	no
UBWT	19	ARS05-1044	no	167	no	100	104			no		no	<b>154</b>	<b>yes</b>	Allele X	no
UBWT	20	ARS05-1234	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	21	ARS07-0004	no	167	no	100	104			no		no	<b>154</b>	<b>yes</b>	Allele X	no
UBWT	22	ARS07-0024	no	<b>185</b>	<b>yes</b>	100	104			no		no	<b>154</b>	<b>yes</b>	Allele X	no
UBWT	23	ARS07-0555	no	<b>185</b>	<b>yes</b>	104	112			no		no	235	no	Allele X	no
UBWT	24	ARS07-0785	no	<b>185</b>	<b>yes</b>	107	112			no		no	235	no	Allele X	no
UBWT	25	ARS07-1105	no	<b>185</b>	<b>yes</b>	107	112			no		no	235	no	Allele X	no
UBWT	26	ARS07-1182	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	27	ARS07-1214	no	160	no	82	<b>87</b>	100	104	<b>yes</b>		no	235	no	Allele X	no
UBWT	28	ARS07-1243	no	165	no	<b>87</b>	100	104		<b>yes</b>	<b>256</b>	<b>yes</b>	235	no	Allele X	no
UBWT	29	VA06HRW-3	no	165	no	100	104			no		no	235	no	Allele X	no
UBWT	30	VA06HRW-49	no	<b>185</b>	<b>yes</b>	112				no		no	235	no	Allele X	no
UBWT	31	VA06HRW-66	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	32	VA06HRW-108	no	167	no	82	<b>87</b>	112		<b>yes</b>		no	235	no	Allele X	no
UBWT	33	VA07HRW-45	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	34	VA07HRW-97	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	35	VA06HRW-43	no	<b>185</b>	<b>yes</b>	107	112			no		no	235	no	Allele X	no
UBWT	36	VA08HRW-12	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	37	VA08HRW-79	no	167	no	107	112			no		no	235	no	Allele X	no
UBWT	38	VA08HRW-98	no	165	no	107	112			no		no	235	no	Allele X	no
UBWT	39	VA08HRW-103	no	165	no	82	<b>87</b>	100	104	<b>yes</b>		no	235	no	Allele X	no
UBWT	40	VA08HRW-104	no	165	no	100	104			no		no	235	no	Allele X	no

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**Rye Translocation -- Hessian Fly -- Barley Yellow Dwarf Virus**  
**2010**

Nursery	Entry	Sample Name	scm9	1RS	cf132	H13	cfa2153	cfa2153	H9	Bdv	Bdv2/3
UBWT	1	AGS2000	<b>207</b>	<b>1RS:1BL</b>	114	no	201		no	184	no
UBWT	2	NC-Neuse		non-1RS	114	no	205		no	184	no
UBWT	3	Tribute	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	4	Hondo	<b>222</b>	<b>1RS:1AL</b>	nd	nd	nd		nd	184	no
UBWT	5	Jagger		non-1RS	114	no	199		no	182	no
UBWT	6	Lakin		non-1RS	114	no	211		no	184	no
UBWT	7	TAM303	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	8	Culpeper		non-1RS	114	no	197		no	184	no
UBWT	9	Charter	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	10	Fannin	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	11	ARS03-4736	<b>222</b>	<b>1RS:1AL</b>	114	no	193		no	184	no
UBWT	12	ARS04-1267	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	13	ARS05-0005		non-1RS	114	no	193		no	184	no
UBWT	14	ARS05-0043		non-1RS	114	no	197		no	184	no
UBWT	15	ARS05-0401	<b>222</b>	<b>1RS:1AL</b>	114	no	197		no	184	no
UBWT	16	ARS05-0403		non-1RS	114	no	193	209	no	184	no
UBWT	17	ARS05-0404		non-1RS	114	no	197		no	184	no
UBWT	18	ARS05-0241	<b>222</b>	<b>1RS:1AL</b>	114	no	205		no	184	no
UBWT	19	ARS05-1044	<b>222</b>	<b>1RS:1AL</b>	114	no	nd		nd	184	no
UBWT	20	ARS05-1234		non-1RS	114	no	195		no	182	no
UBWT	21	ARS07-0004		non-1RS	114	no	193		no	184	no
UBWT	22	ARS07-0024		non-1RS	114	no	209	211	no	184	no
UBWT	23	ARS07-0555		non-1RS	<b>152</b>	<b>yes</b>	167		no	184	no
UBWT	24	ARS07-0785		non-1RS	<b>152</b>	<b>yes</b>	193		no	184	no
UBWT	25	ARS07-1105		non-1RS	114	no	205		no	184	no
UBWT	26	ARS07-1182		non-1RS	114	no	199		no	184	no
UBWT	27	ARS07-1214		non-1RS	114	no	193		no	184	no
UBWT	28	ARS07-1243	<b>222</b>	<b>1RS:1AL</b>	114	no	193		no	184	no
UBWT	29	VA06HRW-3		non-1RS	114	no	205		no	184	no
UBWT	30	VA06HRW-49		non-1RS	114	no	167		no	184	no
UBWT	31	VA06HRW-66		non-1RS	114	no	167		no	184	no
UBWT	32	VA06HRW-108		non-1RS	114	no	191		no	184	no
UBWT	33	VA07HRW-45		non-1RS	114	no	167		no	184	no
UBWT	34	VA07HRW-97		non-1RS	114	no	167		no	184	no
UBWT	35	VA06HRW-43		non-1RS	114	no	211		no	184	no
UBWT	36	VA08HRW-12		non-1RS	114	no	201		no	184	no
UBWT	37	VA08HRW-79		non-1RS	114	no	219		no	184	no
UBWT	38	VA08HRW-98		non-1RS	114	no	211		no	184	no
UBWT	39	VA08HRW-103		non-1RS	114	no	211	219	no	184	no
UBWT	40	VA08HRW-104		non-1RS	114	no	219		no	184	no

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## Quality Traits

2010

Nursery	Entry	Sample Name	Bx7oe	Bx7 over-expressing	umn	umn	umn	umn	Glu-D1	umn	umn	Glu-A1
					25	25	26	26		19	19	
UBWT	1	AGS2000	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	2	NC-Neuse	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	3	Tribute	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	4	Hondo	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	5	Jagger	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	6	Lakin	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	7	TAM303	404	no	<b>275</b>	<b>293</b>			<b>392</b>	<b>409</b>	<b>het</b>	<b>340</b>
UBWT	8	Culpeper	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	9	Charter	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	10	Fannin	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	11	ARS03-4736	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	12	ARS04-1267	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	13	ARS05-0005	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	14	ARS05-0043	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>358</b>
UBWT	15	ARS05-0401	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>358</b>
UBWT	16	ARS05-0403	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	17	ARS05-0404	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	18	ARS05-0241	404	no		<b>300</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	19	ARS05-1044	404	no		<b>300</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	20	ARS05-1234	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	21	ARS07-0004	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	22	ARS07-0024	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	23	ARS07-0555	404	no		<b>293</b>			<b>392</b>	<b>?</b>	<b>340</b>	<b>358</b>
UBWT	24	ARS07-0785	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	25	ARS07-1105	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	26	ARS07-1182	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	27	ARS07-1214	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	28	ARS07-1243	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	29	VA06HRW-3	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	30	VA06HRW-49	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	31	VA06HRW-66	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	32	VA06HRW-108	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>358</b>
UBWT	33	VA07HRW-45	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	34	VA07HRW-97	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>340</b>	<b>Ax2*</b>
UBWT	35	VA06HRW-43	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	36	VA08HRW-12	404	no		<b>300</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	37	VA08HRW-79	404	no	<b>275</b>				<b>392</b>	<b>5+10</b>	<b>340</b>	<b>Ax2*</b>
UBWT	38	VA08HRW-98	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	39	VA08HRW-103	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>
UBWT	40	VA08HRW-104	404	no		<b>293</b>			<b>409</b>	<b>2+12</b>	<b>358</b>	<b>Ax1 or null</b>

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## Quality Traits

2010

dominant marker for hard allele

D1a= soft allele

Allele X=hard allele

Nursery	Entry	Sample Name	pina _TaqMan	pina	pinb D1a-b _TaqMan	pinb D1a-b	pinbD1a-d _TaqMan	pinb D1a-d	Texture
UBWT	1	AGS2000		no	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	soft
UBWT	2	NC-Neuse		no	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	soft
UBWT	3	Tribute		no	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	soft
UBWT	4	Hondo		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	5	Jagger	<b>Allele X</b>	<b>hard</b>	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	6	Lakin		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	7	TAM303		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	8	Culpeper		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	9	Charter		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	10	Fannin	<b>Allele X</b>	<b>hard</b>	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	11	ARS03-4736		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	12	ARS04-1267	<b>Allele X</b>	<b>hard</b>	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	13	ARS05-0005	<b>Allele X</b>	<b>hard</b>	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	14	ARS05-0043		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	15	ARS05-0401	<b>Allele X</b>	<b>hard</b>	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	16	ARS05-0403		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	17	ARS05-0404		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	18	ARS05-0241		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	19	ARS05-1044		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	20	ARS05-1234		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	21	ARS07-0004		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	22	ARS07-0024		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	23	ARS07-0555		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	24	ARS07-0785		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	25	ARS07-1105		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	26	ARS07-1182		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	27	ARS07-1214		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	28	ARS07-1243		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	29	VA06HRW-3		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	30	VA06HRW-49		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	31	VA06HRW-66		no	<b>Both Alleles</b>	<b>het?</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	<b>het?</b>
UBWT	32	VA06HRW-108		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	33	VA07HRW-45	<b>Allele X</b>	<b>hard</b>	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	34	VA07HRW-97	<b>Allele X</b>	<b>hard</b>	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	35	VA06HRW-43	<b>Allele X</b>	<b>hard</b>	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	36	VA08HRW-12		no	<b>Allele Y</b>	<b>D1a=soft</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	soft
UBWT	37	VA08HRW-79		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	38	VA08HRW-98		no	Allele X	D1b/d	Allele Y	D1b/d	hard
UBWT	39	VA08HRW-103	<b>Allele X</b>	<b>hard</b>	<b>Both Alleles</b>	<b>het?</b>	<b>Both Alleles</b>	<b>D1a=soft</b>	hard
UBWT	40	VA08HRW-104		no	Allele X	D1b/d	Allele Y	D1b/d	hard

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