

GRAIN AND FORAGE TRITICALE AND BARLEY LINES
SCREENED FOR GRAIN PRODUCTION
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Abstract

Varieties and experimental lines of winter and spring triticale, and spring barley were planted and screened at the Central Oregon Agricultural Research Center (COARC), at Powell Butte in 1995. The plots were harvested only for grain, but varieties and lines are classified as grain, hay, and dual purpose lines.

Introduction

Cereals offer great potential for both grain and forage production in central Oregon. Robert Metzger and Matt Kolding, retired plant breeders in Oregon, continue to develop lines of winter triticale. A new spring hay barley is being considered for release by Washington State University as is a spring triticale line with an awnletted head from CYMMIT in Mexico. A screening was initiated to look at the adaptability of these lines and varieties, and to document their grain production capabilities and other agronomic traits.

Materials and Methods

The cereals were planted at 30 seeds per square foot (unless otherwise stated in Table 2) at the COARC, Powell Butte, Oregon. The winter cereals were planted on October 6, 1994, and the spring cereals on April 13, 1995, with a plot cone-type planter. Plots were not replicated and were 5 feet x 20 feet. All plots were fertilized with 40 pounds of sulfur in the form of gypsum. The winter triticales were fertilized on March 28, 1995, with 180 pounds of nitrogen fertilizer, while the spring triticale and barleys were fertilized with 120 pounds of nitrogen (ammonium nitrate source) on April 20, 1995. The soft white winter wheat border plot received no fertilizer and one plot was harvested for comparison. Irrigation was as needed with solid-set sprinkler lines. The plots were sprayed with Lorsban insecticide (0.5 lb. a.i./a) on March 29, 1995, and Bronate herbicide (2 pints per acre) on April 26, 1995 using a dual-bicycle tire, 15-foot boom battery operated sprayer. Late boot, heading and flowering dates, lodging, height, head type, and susceptibility to ergot were recorded. An area of 5 feet x 15 feet was harvested with a Wintersteiger grain plot harvester. Four outside rows (four rows out of six rows) of WA 7999-88 barley was harvested (the two inside rows were harvested for forage). Grain was cleaned at the Hyslop Farm, Corvallis, Oregon. All yields are based on 60 pound bushels to allow an easier comparison of the data. Grain protein was measured with a whole grain near infra-red analyzer. Test weight, moisture, and 1,000 kernel weight were determined at Corvallis. Seeds per pound, future seeding rate, grain nitrogen recovery, and grain protein yield were calculated. Grain yield and protein are presented on a 10 and 12 percent moisture basis, respectively.

Results and Discussion

Data for the winter and spring cereal varieties and experimental lines are presented in tables 1-3.

Since there was no replication statistical analyses cannot be made, but gross comparisons can be made. Parma is a line that is being released in Idaho. Producers have used it for forage and have begun using it for grain production as it is high yielding and has a higher lysine content than other triticale varieties. It has excellent lodging resistance, but is very late maturing. Iceberg is a selection that was made from Parma - as the only plants that survived a hard freeze in Canada. Parma has excellent winter hardiness and yet is facultative. Newcale is a midwest variety that is very early maturing. A number of triticale lines had excellent yields and test weights. Some of the winter triticale lines need to be evaluated further in a replicated trial. Severe lodging by some of the lines may have occurred from a bad sprinkler, and a July thunderstorm, though some of the entries did not lodge. The lodging did not seem to shrivel grain as evidenced by the normal to high test weights.

Another interesting entry is M94-4393, an awnletted spring triticale. This line has high test weight (58.1 lb/bu), but even more interesting is its early maturity. M94-4393 reached late boot stage four to six days earlier than did the three spring barley lines, and was nine days earlier than Grace spring triticale. WA 7999-88, a hooded spring barley line, will be released soon by Washington State University. This line had superior lodging resistance and shorter height than Belford.

Table 1. Grain yield, grain protein content, test weight, height, lodging, and 1,000 kernel weight of winter and spring triticale and barley varieties, and experimental lines tested at the COARC, Powell Butte, Oregon in 1995.

Variety/Line	Grain Yield bu/a	Grain Protein	Test Weight lb/bu	Height in.	Lodging	1000 Kernel Weight
Winter (180 lb/a N)						
FT 87788	118.1	8.5	51.9	46	98	37.1
FT 91064	120.6	9.2	55.5	47	40	42.7
M94-? (Salmon)	103.3	8.9	55.4	56	98	39.6
M94-1025	100.3	8.9	55.8	51	95	33.5
M94-93	118.0	8.5	57.0	57	95	39.1
M94-92	103.5	9.2	57.0	52	95	37.5
M94-1114	85.7	10.6	54.1	56	95	40.9
M94-1115	81.9	10.9	54.6	55	95	40.4
M94-1113	75.8	11.0	55.1	58	85	50.2
(3) 1-62 H1031	119.0	8.3	57.0	51	80	43.2
(14) 1-63 H1037*	81.6	9.0	56.3	55	75	43.9
(6) 1-80 H1031	88.2	9.2	55.8	52	60	35.8
(4) 1-70 H1031	88.9	8.4	56.8	45-56	40	41.8
Newcale	89.4	9.7	57.1	47	50	39.8
Parma	132.1	9.1	57.0	45	0	40.4
Iceberg	121.8	8.8	56.4	44	0	43.4
M94-3163>3165	126.2	8.6	58.0	46	0	40.0
M94-2082	121.4	9.2	56.5	45	0	42.2
M94-2113	117.8	9.5	56.0	42	0	43.5
Winter wheat (0 N)	56.3	7.6	59.2		0	40.8
Spring (120 lb/a N)						
Grace	47.8	8.5	53.1		0	41.8
M94-4393	71.1	8.7	58.1	44	0	36.0
WA 7999-88 barley	44.2	9.9	45.1	39	12	39.1
Westford barley				39	0	
Belford barley				42	57	

*...FT 90462 h1001

Table 2. Seeds per pound, future seeding rate, actual 1994 seeding rate, 30 seeds per ft² seeding rate, and head type of winter and sprig triticale, and barley varieties, and experimental lines tested at the COARC, Powell Butte, Oregon in 1995.

Varieties/Lines	Seeds Per Pound	Future Seeding Rate lb/a	Actual 1994 Seeding Rate lb/a	30 Seeds per ft ² Seeding Rate lb/a	Head Type	Ergot
Winter (180 lb/a N)						
FT 87788	12,226	106.9	143.0	143.0	awn	no
FT 91064	10,623	123.0	156.5	156.5	awn	yes
M94-? (Salmon)	11,455	114.1	142.1	142.1	awnlett	no
M94-1025	13,540	96.5	132.5	132.5	awnlett	no
M94-93	11,601	112.6	172.8	172.8	awnlett	no
M94-92	12,096	108.0	158.4	158.4	awn	no
M94-1114	11,090	117.8	94.4	127.7	awn	yes+
M94-1115	11,228	116.4	125.5	141.1	awn	yes
M94-1113	9,036	144.6	111.7	158.4	awn	no
(3) 1-62 H1031	10,500	124.5	168.0	168.0	awn	no
(14) 1-63 111037*	10,333	126.5	164.2	164.2	awn	no
(6) 1-80111031	12,670	103.1	154.6	154.6	awnlett	no
(4) 1-70 111031	10,852	120.4	148.8	148.8	awnlett	no
Newcale	11,397	114.7	103.7	103.7	awn	no
Parma	11,228	116.4	170.9	170.9	awn	no
Iceberg	10,452	125.0	155.2	158.4	awn	no
M94-3163> 3165	11,340	115.2	142.1	142.1	awn	no
M94-2082	10,749	121.6	178.6	178.6	awn	no
M94-2113	10,428	125.3	160.3	160.3	awn	no
Winter wheat (0 N)	11,118	117.5	96.0	96.0	awn	no
Spring (120 lb/a N)						
Grace	10,852	120.4	132.5	132.5	awn	no
M94-4393	12,600	103.7	157.5	157.5	awnlett	no
WA 7999-88 barley	11,061	112.6	129.6	129.6	hooded	no
Westford barley	---		109.4		hooded	no
Belford barley			113.3		hooded	no

*...FT 90462 h1001

Table 3. Grain nitrogen recovery, grain protein yield, late boot date, heading date, and flower date of winter and spring triticale and barley varieties and experimental lines tested at the COARC, Powell Butte, Oregon in 1995.

Variety/Line	Grain Nitrogen Recovery lb/a	Grain Protein Yield lb/a	Late Boot Date 1/1=1	Full Heading Date 1/1=1	Full Flower Date 1/1=1
Winter (180 lb/a N)					
FT 87788	105.3	600.2		172	178
FT 91064	116.6	664.6		177	182
M94-? (Salmon)	96.9	552.3		166	173
M94-1025	94.0	535.8		167	174
M94-93	105.7	602.5		166	173
M94-92	100.2	571.1		166	173
M94-1114	95.2	542.6		168	171
M94-1115	93.9	535.2		172	171
M94-1113	88.0	501.6		166	174
(3) 1-62 H1031	104.4	595.1		171	176
(14) 1-63 H1037*	77.0	438.9			176
(6) 1-80 H1031	85.6	487.9		166	175
(4) 1-70 H1031	78.9	449.7		166	175
Newcale	91.3	520.4		155	169
Parma	125.8	717.1		174	180
Iceberg	112.6	641.8		174	180
M94-3163 >3165	114.8	654.4		160	177
M94-2082	117.8	671.5		171	178
M94-2113	117.3	668.6			178
Winter wheat (0 N)	44.8	255.4			
Spring (120 lb/a N)					
Grace	42.8	244.0	179		196
M94-4393	65.0	370.5	170		196
WA 7999-88 barley	45.9	261.6	176		
Westford barley			178		
Belford barley			174		

*...FT 90462 h1001