

## ONION VARIETY TRIAL

Clint Shock, Joey Ishida, and Eric P. Eldredge  
Malheur Experiment Station  
Oregon State University  
Ontario, Oregon, 1996

### Purpose

This trial compared commercial varieties and experimental lines of yellow, white, and red onions for yield and grade. Field observations were made for relative maturity, incidence of plate rot, and bolting.

### Procedures

The 1996 trials were conducted on a Owyhee silt loam soil with 1.2 percent organic matter and a pH of 7.3. The field had previously been planted to wheat. Before plowing, 100 lbs/ac of  $P_2O_5$ , and 60 lbs N/ac were broadcast. The wheat stubble was shredded and the field deep-chiseled, disked, irrigated, moldboard-plowed, roller-harrowed, and bedded in the fall. After bedding, the field was left until spring without further tillage.

Onion seed for entry in the trial was received from 15 companies: American Takii, Aristogene, Asgrow, Bejo, Champion, Crookham, Ferry Morse, Harris Moran, Petoseed, Rio Colorado, Rispens Seed, Scott Seeds, Shamrock, Sunseeds, and Waldow Seed. Seventy-one onion varieties were planted April 9 in plots four rows wide and 27 feet long. The onions were planted on 22-inch single-row beds. Each variety was planted with five replications. Seed for each row was prepackaged using enough seed for a planting rate of 12 viable seeds per foot of row. Seed was planted using four cone-seeders mounted on John Deere Model 71 Flexi-planter units equipped with disc openers.

The onions were furrow-irrigated during the growing season. The first irrigation was applied on April 13 to supply the soil with moisture for seed germination. On May 8, alleys 3 ft wide were cut between plots, leaving plots 24 ft long. On May 28 through June 1 the seedling onion plants were thinned by hand to a plant population of four plants per foot of row (3-inch spacing between individual onion plants). On June 3, 100 lb N/ac as Urea was sidedressed on each side of every row. On June 15, a second sidedressed application of 100 lb N/ac as Urea was applied.

The trial was managed to avoid yield reductions from pests. Dacthal was applied on May 4, and Lorsban 15G was applied for onion maggot control on May 11. Weeds were controlled with cultivations and low-rate herbicide applications as needed until layby.

On July 5, layby herbicides Buctril, Goal, Poast, and Prowl were applied, along with Warrior insecticide for thrips control. On August 7, Lannate was applied by airplane.

Bulb maturity ratings for each plot were recorded on August 22, 30, and September 9, as visual estimates of percent dry leaf material in each plot, and percent of bulbs with necks collapsed and leaves on the ground. Those percentages for each date were averaged for the reported maturity ratings. Plate rot was counted on bulbs in the two center rows of each plot on September 4-6, and the number of bolters in the two center rows of each plot was recorded on September 9.

The onion bulbs were lifted on September 11 to field-dry. On September 15, 0.10 inch of rain fell, followed by 0.44 inch of rain on September 16. On September 25-26 the onions were hand-topped and placed into slatted wooden crates. The crates were placed into wooden bins (4 x 4 x 6 feet) on September 27, and the bins were moved into storage on September 30 and October 1.

The onion bulbs were removed from storage and graded from January 2-8, 1997. Bulbs were graded according to their diameter and quality. Size categories were 2¼ to 3-inch (medium), 3 to 4-inch (jumbo), and 4-inch and larger (colossal). Split bulbs and bulbs smaller than 2¼ inches were graded as No. 2s. Bulbs rotted by *Botrytis* neckrot, plate rot, and bacterial decay during storage were weighed and the percent of storage rot was calculated.

Varietal differences were compared using ANOVA and least significant differences at the 5 percent probability level, LSD (0.05).

### Results

Varieties are listed by company in alphabetical order and ranked by marketable bulb yield for each company's varieties (Table 1). Average marketable yield was 806 cwt/ac with 27 percent colossal-sized bulbs, 72 percent jumbo, and 1 percent medium. Average cullage for No. 2's (3 percent) and storage rot (4 percent) are expressed in percentage above the total marketable yield. Bulbs smaller than 2¼ inches were included in the No. 2s category, which represents mostly split double bulbs. Small onions were less than 1 percent of yield for all varieties, and many varieties produced no small bulbs.

The LSD (0.05) values at the bottom of Table 1 should be considered when comparisons are made between varieties for yield and grade. Differences equal to or greater than the LSD (0.05) value for a column should exist before any variety is considered different from any other variety in the category compared in that column.

Table 1. Yield and grade of experimental and commercial onion varieties evaluated in 1996. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1996.

Seed company	Onion variety	Bulb color	Marketable yield by grade						Non-marketable			Maturity rating			Plate rot		Bolters	
			Total	> 4 inch		3 - 4 inch		2 1/4 - 3 inch		Storage rot	No. 2's		8/22	8/30	9/6	9/4	9/9	
			cwt/ac	cwt/ac	%	cwt/ac	%	cwt/ac	%	%	cwt/ac	%	----- % -----					
American Taki	9003-C	yellow	1131	630	55.1	499	44.8	1.5	0.1	4.8	73	6.4	0	3	19	2.9	1.1	
	9003	yellow	988	377	38.6	606	60.9	5.7	0.6	9.4	43	4.4	0	1	5	3.1	0.3	
	ATX 596	yellow	893	309	34.6	582	65.1	2.8	0.3	2.1	22	2.5	2	6	16	3.5	0.2	
	ATX 589	yellow	869	351	40.8	514	58.8	3.5	0.4	3.2	28	3.3	2	3	13	4.9	0.8	
	Condor	yellow	818	225	27.8	591	72.0	1.2	0.1	4.4	13	1.6	14	22	44	10.3	0.4	
	T-406	yellow	800	177	22.0	622	77.8	1.0	0.1	2.1	20	2.5	3	6	24	5.3	1.3	
	T-432	yellow	699	295	42.8	399	56.6	4.1	0.6	5.7	21	3.2	2	11	20	5.1	0.0	
	Frontier	yellow	503	18	3.2	467	93.2	12.7	2.5	3.5	8	1.7	64	75	89	5.6	0.0	
Aristogene	Seville	yellow	1093	493	45.1	597	54.6	2.4	0.2	3.7	13	1.2	6	12	30	2.3	1.9	
	El Charro	yellow	1071	467	43.6	601	56.1	2.9	0.3	5.5	11	1.0	4	9	21	4.5	1.5	
	El Padre	yellow	1040	479	46.3	559	53.4	1.8	0.2	2.3	10	1.0	1	3	16	3.4	1.5	
	Bravo	yellow	1015	460	45.2	552	54.5	1.3	0.1	3.8	29	3.0	6	10	21	4.8	1.9	
	Maritime	yellow	910	199	21.7	707	77.8	2.3	0.2	2.9	11	1.2	25	40	53	6.9	0.8	
	Envoy	yellow	881	249	28.3	628	71.3	3.7	0.4	2.8	25	2.9	33	43	52	5.3	0.9	
Asgrow	Viper	yellow	885	242	27.3	640	72.4	2.8	0.3	5.8	28	3.2	29	40	50	4.5	2.2	
	Viceroy	yellow	807	155	19.2	645	80.1	5.8	0.7	1.9	19	2.3	22	38	52	3.4	0.0	
	Regiment	yellow	775	241	30.7	534	69.3	0.4	0.1	4.1	16	2.1	37	48	51	9.9	1.1	
	Fury	yellow	638	96	15.5	536	83.6	4.7	0.7	2.4	39	6.3	27	35	50	7.8	0.0	
Bejo Seeds	Gladstone	white	766	102	13.3	654	85.4	9.6	1.2	2.0	19	2.5	1	3	13	4.0	0.3	
	BGS 77F1	yellow	706	90	12.6	608	86.2	5.7	0.8	1.1	19	2.7	2	9	20	3.4	0.1	
	Daytona	yellow	704	93	13.1	603	85.7	6.7	1.0	1.1	21	3.0	2	5	11	4.9	0.3	
	Redwing	red	656	75	11.6	580	88.2	1.6	0.2	1.9	4	0.7	3	11	22	10.0	0.0	
	Tamara F1	yellow	609	17	2.6	585	96.1	5.5	1.0	4.1	2	0.4	23	47	60	8.8	0.0	
	Santana	yellow	534	34	6.4	493	92.4	6.3	1.1	4.0	8	1.5	23	40	55	14.6	0.0	
Champion	PX 81892	red	498	121	24.6	368	73.6	5.4	1.1	6.3	16	3.1	11	13	19	8.3	0.0	
Crookham	Sweet Amber	yellow	990	342	35.1	644	64.5	3.4	0.3	4.5	39	4.0	13	27	42	3.6	0.8	
	Celebrity	yellow	985	426	43.4	553	56.0	4.5	0.5	4.4	39	4.0	1	6	18	3.5	1.6	
	Sweet Perfection	yellow	970	439	45.3	528	54.4	1.8	0.2	3.0	42	4.3	12	18	30	3.8	0.8	
	XPH 93386	yellow	708	118	16.9	581	81.9	7.1	1.0	3.2	21	3.0	10	22	43	5.2	1.5	
Ferry Morse	FMX 2074	yellow	886	322	35.9	561	63.7	3.0	0.3	3.0	11	1.3	7	22	35	5.8	1.0	
	Caesar	yellow	885	231	26.2	651	73.4	3.5	0.4	2.5	7	1.1	3	11	32	4.4	0.8	
	Oro Grande	yellow	857	270	31.2	582	68.4	2.4	0.3	3.2	8	1.0	5	11	30	4.5	1.0	
	Augustus	yellow	838	249	30.3	588	69.6	1.0	0.1	4.8	14	1.8	2	6	14	3.4	1.2	
	Fabius	yellow	830	175	21.0	652	78.5	2.7	0.3	2.7	16	1.9	22	36	52	7.0	2.1	
Harris Moran	Impact	yellow	598	26	4.7	566	94.3	5.5	1.0	1.8	22	3.7	47	54	67	3.8	0.6	
	White Ivory	white	492	7	1.4	469	95.2	14.6	2.9	1.4	66	13.4	12	17	35	6.3	0.1	
	Squire	yellow	478	36	7.8	431	89.9	10.2	2.1	5.4	16	3.3	35	49	57	11.1	0.0	

Table 1 continued on next page

Seed company	Onion variety	Bulb color	Marketable yield by grade							Non-marketable			Maturity rating			Plate rot	Bolters
			Total	> 4 inch		3 - 4 inch		2 1/4 - 3 inch		Storage rot	No. 2's		8/22	8/30	9/6	9/4	9/9
			cwt/ac	cwt/ac	%	cwt/ac	%	cwt/ac	%	%	cwt/ac	%	----- % -----				
Petoseed	Quest	yellow	939	579	62.1	359	37.8	0.8	0.1	4.6	14	1.5	2	5	20	9.1	0.6
	Atlas	yellow	925	627	68.0	296	31.8	1.3	0.2	5.0	37	4.2	6	17	31	9.3	0.8
	Vision	yellow	917	430	47.2	485	52.6	1.0	0.1	4.3	22	2.5	2	5	21	7.2	0.6
	Pinnacle	yellow	855	191	22.4	661	77.1	2.4	0.3	1.4	3	0.4	6	15	40	5.1	0.0
	Apex	yellow	828	157	18.8	667	80.9	2.6	0.3	1.4	16	2.0	3	6	24	3.3	0.0
	Teton	yellow	778	188	24.3	589	75.6	0.6	0.1	3.9	15	2.0	15	27	48	8.9	1.9
Rio Colorado	6077	yellow	851	277	32.8	571	66.9	2.3	0.3	2.2	65	7.7	13	23	36	5.3	0.6
	Challenge	yellow	846	262	31.0	581	68.8	2.1	0.3	3.5	42	4.9	14	22	40	5.8	1.0
	Rio Seco	yellow	801	112	13.9	683	85.5	3.4	0.4	4.5	19	2.4	50	53	55	7.6	0.2
	Discovery	yellow	733	156	21.4	567	77.2	9.8	1.3	4.0	28	3.8	27	38	45	5.6	0.3
	RNX 10090	yellow	670	71	10.6	598	89.2	1.2	0.2	4.2	8	1.2	36	45	53	8.3	0.6
	RCS 6171	yellow	655	113	17.4	536	81.7	3.7	0.6	6.3	37	5.8	44	47	52	10.2	0.6
	RNX-10001	white	550	28	5.1	509	92.3	11.9	2.2	2.8	12	2.3	20	26	43	3.7	0.1
Rispen Seeds	Golden Security	yellow	1022	467	45.5	553	54.3	2.3	0.2	3.7	48	4.7	2	3	17	1.5	1.1
	Victory	yellow	982	438	44.7	540	55.0	2.0	0.2	3.4	43	4.3	8	19	33	3.6	0.2
	Wrangler	yellow	786	161	20.9	586	74.6	36.0	4.1	2.2	24	3.0	3	12	29	3.8	0.2
Scottseed	Great Scott	yellow	900	404	45.2	495	54.6	0.3	0.03	3.9	62	7.0	3	8	25	2.8	0.2
Shamrock	55C 1992	yellow	788	165	20.7	614	78.2	7.3	0.9	3.0	40	5.1	8	18	28	5.2	0.3
	Impala	yellow	751	109	14.0	636	85.1	4.4	0.7	4.5	73	10.0	47	52	57	4.2	0.0
	SSC 3359	yellow	697	149	21.3	544	78.0	4.5	0.7	3.6	46	6.6	14	26	38	2.9	0.0
	SSC 9983	yellow	629	101	16.1	525	83.5	2.8	0.5	3.4	17	2.8	20	37	51	9.3	1.2
Sunseeds	Sunre 1430	yellow	1061	449	42.2	611	57.7	1.1	0.1	0.9	8	0.7	16	36	46	1.8	0.2
	Vaquero	yellow	996	336	33.9	657	65.7	3.2	0.3	2.9	2	0.2	3	6	27	2.4	0.3
	Snow White	white	853	364	42.5	485	56.9	3.0	0.4	7.2	41	4.8	0	3	5	3.1	0.8
	Bullring	yellow	834	171	19.9	661	79.7	2.4	0.3	5.9	5	0.6	33	49	54	8.4	3.5
	Winner	yellow	779	386	49.5	389	50.0	3.3	0.4	9.4	10	1.3	19	33	42	17.1	2.8
	Tesoro	yellow	764	155	20.1	606	79.4	3.5	0.5	1.6	15	2.0	15	27	45	2.9	1.0
	Sunex 1440	yellow	744	99	13.4	639	85.8	4.5	0.6	2.2	15	2.1	6	22	46	6.9	0.0
	Valiant	yellow	721	122	16.8	593	82.3	5.1	0.7	4.1	11	1.5	11	22	49	10.0	1.5
	Blanco Duro PVP	white	691	116	17.3	572	82.2	2.6	0.4	6.2	13	2.1	1	3	12	3.9	0.4
	Mambo	red	604	69	11.2	525	87.1	8.1	1.3	3.0	29	4.8	2	8	16	7.6	0.0
Tango	red	493	18	3.5	465	94.5	7.1	1.4	3.7	9	1.8	13	24	40	11.1	0.0	
Waldow Seeds	X202	yellow	1004	385	38.3	615	61.4	3.5	0.3	9.6	24	2.4	1	2	12	3.7	1.6
	X201	yellow	949	402	42.7	546	57.1	1.1	0.1	12.3	33	3.7	2	9	19	4.6	1.6
Mean			805.6	237.9	27.13	562.5	72.12	4.40	0.63	3.87	24.1	3.1	13.5	21.7	34.7	5.9	0.7
LSD (0.05)			73.5	81.0	9.46	101.47	9.34	10.27	1.21	3.85	19.38	2.4	8.12	8.73	9.17	3.3	0.8

5 non-marketable percents and cwt/ac are over and above total marketable yield