

UTAH Onion Variety Trial - 2016

Onion Plots were planted on 24 March in Corinne, UT and on 20 March, 2016 in West Haven, UT. A total of 31 cultivars (Table 1) from six (6) seed companies were evaluated. Rows were 25 feet long on 39 inch beds (2 double rows; 12 inches apart on the bed, seeds spaced every 3.75 inches in-row) with three (3) replications at each site.

Onions were managed in accordance with the cultural activities of the cooperating growers. Weeds were controlled with herbicides according to their practices. Fields were hand weeded once or twice during the year. Insects were controlled as required and plants were irrigated weekly.

Crop Evaluation.

In late-May plant stands were evaluated. All onion seedlings in separate 3-ft sections of each double row of each replication were counted. The incidence of IYSV was rated in early August during early top-down evaluations (West Haven only). The IYSV disease severity ratings, {as per *alliumnet.com*; 0 (no symptoms), 1 (small), 2 (medium), 3 (large), 4(large+)} was used.

Crop maturity was rated weekly beginning on 28 July and continued through 8 September. Plots were rated as 0 (all leaves erect), 5, 10, 25, 50, 75, 90, 95 or 100% (all leaves fallen over) to determine the percent top down. Bulbs were lifted by the grower in early September. One week later a representative section in the middle of each plot was hand topped, cured in the field for a few days and bagged. Each plot consisted of 40-50 lbs. of onion bulbs. Bagged bulbs were removed from the field



and further cured in a well ventilated shed before grading in early-October. Bulbs were mechanically sized on a rotating grading table as colossal (4"+), large jumbos (3.5-4"), jumbos (3-3.5"), mediums (2.25-3") and culls (<2.25" and/or rotten). Grade sizes were counted and weighed and the jumbo and larger bulbs were placed in a commercial storage shed in Corinne in late October. Bulbs will be further evaluated in late January 2017. At that time, the varieties will be evaluated for storage weight loss (pre-stored weight minus post-stored weight plus rots) and single centers.

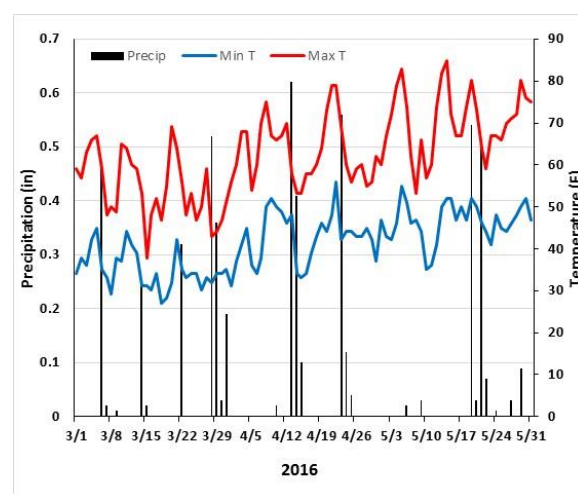


Figure 1. Air temperatures and precipitation (Mar 1 - Jun 1, 2016); Ogden Airport.

Comments about 2016

Planting and weather conditions from mid-March to early April were considered good and most onions in Utah were planted by late March. Soil conditions at planting were dry surface and moisture at ½ inches. There were regular rain events after planting (Fig 1 & 2) which provided sufficient moisture for seed germination. Cool temperatures (Fig 1) and slow accumulation of growing degree days (Fig 2) in late March were noted but by April, temperatures improved and contributed to good growing conditions. Precipitation events were regularly spaced and adequate moisture occurred during the establishment period of March and April. Seedling emergence was slow due to several cool periods. These events did not affect plant populations greatly. May was warmer than normal which aided onion growth considerably.

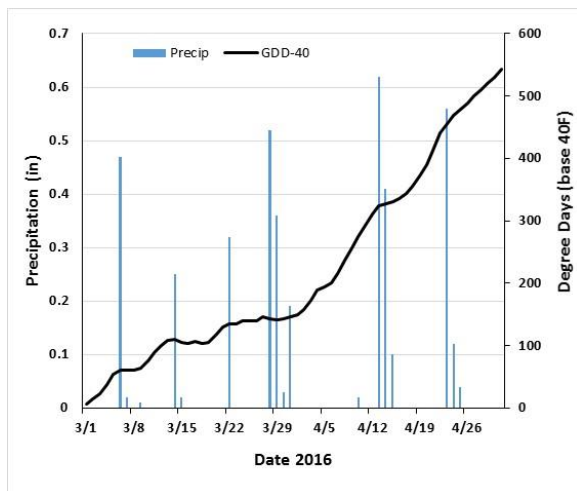


Figure 2. Growing degree day accumulation and rain, Ogden Airport (Mar 1 - May 1).

Rain events during the May-June period were normal but some growers reported imbedded hail in these storms (Box Elder co.) which affected plant stands and growth. Our research site in Corinne experienced

two (2) significant hail events which resulted in significant plant losses and damage that forced the site to be abandoned. Generally in Utah, early June temperatures were normal and onions began to grow rapidly as growing degree day accumulated. July and August growing conditions were dry and most onion production areas reported no further problems.

The September harvest period was wet (3.55 inches) with an average monthly temperature of 65F. Over 2 inches of rain fell on 22-23 September which slowed harvest and wet weather continued into October. A dry period in early October helped dry the crop and aided in harvest. Most growers finished field bulb removal by late October. In general, yields were considered to be very good to excellent.

The field work necessary for bed preparation for the 2017 planting season was also delayed due to wet soils and growers indicate that similar onion acreage would be planted in 2017.

Plant Populations

Stand counts (Table 1) were considered good in West Weber and Corinne. Summer weather conditions in 2016 (mid-June to early-September) were normal and no days above 100F were recorded in either of the two production regions. Average monthly high temperature in June, July and August was 88F, 93F and 90F, respectively during 2016. These averages were above the 30 year average monthly temperature but were still considered good growing conditions for onions. Utah growers reported that there was sufficient water to grow the crop. Plant growth was good throughout the summer and thrips pressure was reported to be moderate. Visual IYSV symptoms were noted in most fields in early August and in general, pressure was considered to be light

at the time of evaluation with severity ratings of about one (1) (alliumnet.com). In the future, additional evaluations should be made as IYSV severity can change rapidly. Some commercial fields in Utah had high incidence of IYSV that contributed to yield loss, but overall, IYSV incidence was assessed as moderate as reported by growers. Crop maturity, as evaluated from top-down data (Table 2) was very early in 2016. Historically, early maturing cultivars are at 50% top-down in mid-August with late cultivars achieving this stage of development in early September. Early maturity may contribute to lower average yields noted. In general, the onion crop sized very well and many fields had excellent productivity with a high percentage of large jumbo and colossal sized bulbs.

2016 Cultivar Productivity.

Yield performances and maturity ratings for the 31 varieties tested in West Weber are listed in Table 2. Due to heavy stand losses associated with hail events in the Corinne site, that location was not evaluated for maturity or harvest. Varieties are ranked from 1 to 31 with #1 having the highest and #31 the lowest marketable yield (colossal, large jumbo, jumbo, and medium sized bulbs).

Average marketable yield across the 31 entries grown in West Weber was 1391 bags/acre in 2016 (Table 2). Jumbo, large jumbo and colossal bulb yield accounted for 86% of the average total yield for all varieties tested. The highest marketable yield was Grand Perfection (American Takii) and the lowest Esteem (Crookham).

Graded marketable bulbs were placed into storage in late October. On January 26, bulbs were re-evaluated for storage weight loss associated with water loss/shrinkage (sample weight into storage minus post-storage weight) and storage related defects (soft rot, neck rot, mold, etc) and other disorders (greening, sprouts, double bulbs, etc). Thirty 30 sound bulbs (10 bulbs per replication; random mix of sizes) cut to determine single centers. A sample of the bulbs were displayed at the 2017 USU Onion Association Meetings (Feb. 14).

Of the varieties evaluated, most seed companies had one or more of their varieties perform in the top 15. Yield, grade assessment are reported in Table 2. Storage weight losses were higher than noted in previous years. Fall rains and damp harvest conditions may have contributed to greater water loss in storage. While many varieties had high percentage of double centers (Table 2), overall, the percentage of losses due to sprouts, mold, rots, and other defects was considered to be very low (>5%).

Variety performance is known to vary with soil type, planting date, fertilizer program, irrigation schedule, and general plant care. Growers using the information in Table 2 should consult further with the seed company representatives to get more detailed information about variety performance before selecting a new cultivar for planting on their farm. If you would like to discuss these findings with me, please feel free to contact me.

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Table 1. Onion planted at two sites in Utah. Stand counts (seed drop ~13 seeds per bed foot) collected in May. IYSV ratings taken on 11 Aug; rating of 0 (none) -5 (completely dead).

Seed Company	Cultivar	Corinne		West Weber	
		Stand Count (plants/3 ft)	IYSV Incidence	Stand Count (plants/3 ft)	IYSV Incidence
Bejo	Calibra	29.7	-	29.7	1.0
Bejo	Crockett	28.0	-	29.0	1.0
Bejo	Delgado	27.7	-	28.3	0.7
Bejo	Hamilton	28.7	-	29.0	1.0
Bejo	Legend	28.3	-	28.0	1.3
Bejo	Red Carpet	28.3	-	28.7	1.0
Crookham	Avalon	27.3	-	26.7	1.3
Crookham	Esteem	27.0	-	23.7	0.7
Crookham	Morpheus	29.7	-	26.3	0.3
Crookham	Oracle	29.7	-	22.7	1.0
Crookham	Red Beret	30.3	-	26.0	1.3
Crookham	Scout	29.3	-	27.3	0.7
Nunhems	Anillo	30.7	-	30.0	0.7
Nunhems	Arcero	27.7	-	27.3	0.3
Nunhems	Granero	30.0	-	28.7	1.0
Nunhems	Joaquin	28.0	-	27.0	1.3
Nunhems	Marengo	29.0	-	28.7	1.0
Nunhems	Ranchero	30.3	-	29.7	1.0
Nunhems	Vaquero	29.7	-	28.0	1.3
Sakata	Dulce Reina	30.3	-	28.7	1.3
Sakata	Lasso	29.7	-	30.3	0.3
Sakata	Yukon	31.0	-	28.3	1.0
Seminis	XP 07716000	30.0	-	29.3	0.3
Seminis	SV4643NT	30.3	-	27.0	1.0
Seminis	SV6646NW	29.7	-	28.0	1.0
Seminis	SV6672NW	27.3	-	28.3	0.7
Seminis	Swale	28.7	-	26.0	1.0
Seminis	Tucannon	29.0	-	28.0	0.3
Amer.Takii	Grand Perfect.	27.7	-	27.3	0.3
Amer.Takii	Ridge Line	28.3	-	26.3	1.3
Amer.Takii	Traverse	28.3	-	27.7	1.3
lsd 0.05		2.6		3.9	0.93

§ - IYSV rating based on replicate averages

TABLE 2. Yield and storage of 31 onions varieties grown in West Weber, UT in 2016.

SOURCE	VARIETY	Yield (bags/A)			Colossal (4+")		LgJumbo (3.5-4")		Jumbo (3-3.5")		Medium(2.25-3")		Cull (<2.25+rots)		Top-Down ⁴	% Wt loss ⁵	% Single Centers
		Total	Market ¹	Rank ²	bags	% ³	bags	% ³	bags	% ³	bags	% ³	bags	% ³			
Bejo	Calibra	1269	1221	25	144	11	240	19	740	58	97	8	48	4	10-Aug	16.8	21.7
Bejo	Crockett	1341	1281	23	15	1	60	4	1050	78	156	12	60	4	15-Aug	14.5	26.7
Bejo	Delgado	1670	1635	4	253	15	231	14	1048	63	103	6	35	2	8-Aug	10.2	60.0
Bejo	Hamilton	1319	1254	24	18	1	116	9	960	73	159	12	65	5	11-Aug	16.0	46.7
Bejo	Legend	1341	1308	19	258	19	237	18	747	56	65	5	33	2	8-Aug	13.8	45.0
Bejo	Red Carpet	1233	1150	27	16	1	57	5	918	74	159	13	82	7	14-Aug	16.5	36.7
Crookham	Avalon	1518	1420	14	403	27	238	16	608	40	169	11	98	6	1-Aug	24.2	43.3
Crookham	Esteem	1081	991	31	48	4	15	1	696	64	232	21	89	8	6-Aug	30.9	83.3
Crookham	Morpheus	1468	1360	16	64	4	86	6	1010	69	201	14	108	7	5-Aug	18.5	83.3
Crookham	Oracle	1447	1390	15	286	20	114	8	821	57	169	12	57	4	6-Aug	22.1	71.7
Crookham	Red Beret	1148	1052	30	125	11	113	10	654	57	161	14	96	8	7-Aug	18.8	86.3
Crookham	Scout	1668	1632	5	394	24	305	18	821	49	112	7	37	2	5-Aug	13.4	56.7
Nunhems	Anillo	1448	1358	17	48	3	95	7	1040	72	175	12	90	6	5-Aug	17.6	73.3
Nunhems	Arcero	1523	1472	12	159	10	155	10	1039	68	119	8	51	3	5-Aug	15.4	79.2
Nunhems	Granero	1611	1539	8	167	10	189	12	1016	63	166	10	72	4	3-Aug	21.7	56.7
Nunhems	Joaquin	1530	1467	13	428	28	213	14	718	47	108	7	62	4	6-Aug	12.0	93.3
Nunhems	Marengo	1365	1307	20	125	9	93	7	922	68	167	12	57	4	8-Aug	17.5	60.8
Nunhems	Ranchero	1737	1680	3	304	18	216	12	1029	59	131	8	57	3	5-Aug	11.8	48.3
Nunhems	Vaquero	1674	1620	7	267	16	260	16	989	59	104	6	54	3	3-Aug	10.6	53.3
Sakata	Dulce reina	1528	1488	10	555	36	195	13	659	43	79	5	40	3	5-Aug	10.4	50.0
Sakata	Lasso	1386	1306	21	413	30	119	9	685	49	90	6	80	6	6-Aug	13.3	68.3
Sakata	Yukon	1656	1630	6	669	40	294	18	611	37	56	3	26	2	6-Aug	8.3	36.7
Seminis	XP 07716000	1594	1480	11	373	23	191	12	832	52	84	5	114	7	5-Aug	11.8	76.7
Seminis	SV4643NT	1161	1072	29	180	15	163	14	583	50	146	13	89	8	5-Aug	20.6	35.8
Seminis	SV6646NW	1599	1514	9	17	1	188	12	1178	74	131	8	85	5	6-Aug	12.4	85.0
Seminis	SV6672NW	1765	1729	2	389	22	188	11	1074	61	78	4	36	2	3-Aug	11.6	70.0
Seminis	Swale	1246	1190	26	167	13	128	10	749	60	146	12	56	5	5-Aug	11.6	70.0
Seminis	Tucannon	1374	1283	22	68	5	70	5	995	72	150	11	91	7	5-Aug	16.7	80.0
Am.Takii	Grand Perfection	1938	1858	1	431	22	263	14	1031	53	133	7	80	4	8-Aug	7.9	27.8
Am.Takii	Ridge Line	1370	1332	18	245	18	139	10	879	64	69	5	38	3	5-Aug	8.1	30.0
Am.Takii	Traverse	1189	1103	28	0	0	15	1	812	68	275	23	86	7	2-Aug	30.0	46.7
Grower		1410	1353		384	27	176	12	690	49	103	7	58	4	8-Aug	9.2	70.0
lsd 0.05		424	490		408		182		392		115		56			13.5	45.2