

**2018 Onion Variety Trial
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Rock Springs, PA**

Date seeded: February 12, 2018

Date transplanted in field: May 7, 2018

Population: 40 plants per plot (unless noted)

Production system: raised beds covered with black plastic mulch with 2 drip irrigation tapes placed 1.5 inches deep in bed. Four row/bed 5.0 feet long with 6x6 inch spacing, 40 plants/rep

Design: Randomized Complete Block with 3 replications

Herbicide Application: Medal at 1.5 pts/acre

Fertility: April 26, 2018, broadcast and incorporated 500 lbs/A of 19-19-19 and incorporated in the soil prior to laying beds and transplanting the onions.

Harvested:

September 8, 2018 (Scout, Candy, Cabernet)

September 15, 2018 (Rhino, Rossi Di Milano)

September 20, 2018 (Red Hawk, Red Mt., Yukon, Yosemite, Monastrell)

September 24, 2018 (Aruba, Great Western, Dulce Reina, Saffron, Sedona, Mondella, Cherry Mountain, Red Carpet, Diamond Swan, Lyrica, White Opera, LA50)

Drying: Bulbs from individual plots were placed in 100 lb. potato Burlap bags and placed on benches, after harvest, in a 30' x 96' high tunnel covered with 2 layers of row cover.

Approximately 40 bulbs of each variety were placed in a wooden slatted box in 55 F storage

Graded: October 26, 2018. Approximately 40 bulbs of each variety were placed in a wooden slatted box in 55 F storage before shipping for testing of soluble solids and pungency

Samples processed for pungency and sugars: November 1, 2018

Table 1. Onion Varieties evaluated in 2018.

Variety	Source	Bulb Color
Aruba	Sakata	Yellow
Yosemite	Sakata	Yellow
Saffron	DePalmer Seeds	Yellow
Rhino	Hazera Seed	Yellow
Mondella	Seedway	Yellow
Scout	Johnny's	Yellow
Candy	Field grown transplants	Yellow
Yukon		Yellow
Cherry Mountain	DePalmer Seeds	Red
Cabernet	Johnny's	Red
Monastrell	Johnny's	Red
Rossa di Milano	Johnny's	Red
Red Hawk	Bejo	Red
Red Mountain	Bejo	Red
Red Carpet		Red
Diamond Swan	DePalmer Seeds	white
Lyrca	Tozer	white
White Opera	Tozer	white

Results

Eighteen onion varieties (Table 1) were seeded on 12 February in 200 plug seed trays with _____. Transplants were cut and maintained on 14 March and 23 April at a 4-inch height in the greenhouse prior to transplanting in the field. Five hundred pounds of 19-19-19 per acre was incorporated into the soil prior to laying beds and transplanting the onions. Medal was applied at 1.5 pts/acre on _____ for early weed control. Hand-pulling/hoeing of weeds was used the rest of the growing season. Growing conditions in 2018 were not ideal. While temperatures were average for the growing season, the area around the Horticulture Research Farm, Rock Springs set a summer rainfall record (previous record set in 2003). These weather conditions may have adversely affected yield and bulb size when compared to previous years.

The Pennsylvania standard yellow onion variety, Candy, yielded 15.38 tons per acre (Table 2) which was the highest not only among the yellows but throughout the whole trial. Scout, Aruba, and Yukon were the next highest yielding yellows at 13.43T/A, 12.4T/A, and 12.30 T/A respectively. Average bulb size for yellow varieties was highest with Yukon at 13.77 ounces (oz), followed by Mondella (13.13 oz.) and Aruba (13 oz.). Yukon's average bulb size was the highest for all varieties in the trial. For large bulbs, Mondella was the highest with 68 percent of bulbs greater than 3 inches in diameter.

Seven reds were trialed and the highest marketable yielding red was Red Hawk at 13.43 T/A followed by Red Mountain and Cherry Mountain at 11.47 T/A and 11.28 T/A respectively. Red Hawk also had the highest average bulb size at 11.38 oz with Red Mountain (10.11 oz.) and Red Carpet (10.69 oz.) the next highest. For large bulbs, Red Hawk was the highest with 55 percent of bulbs greater than 3 inches in diameter.

Three whites were evaluated and Lyrica was the highest yielding white variety at 13.02 T/A followed by White Opera at 11.5 T/A. Lyrica also produced the highest average bulb size at 12.24 oz. For large bulbs, Lyrica was the highest with 51 percent of bulbs greater than 3 inches in diameter.

Culls were very low with Red Mountain, Diamond Swan, and White Opera having the highest amount (Table 3). The pungency ratings for all the onion varieties fell into the very mild sweet onion level (1-4 micromoles (Table 3). Five of the seven red varieties had the highest soluble solid levels in the trial (Red Carpet, Red Mountain, Rossi do Milano, Cherry Mountain, and Red Hawk). The highest soluble solids for the yellow and white varieties were Mondella and White Opera respectively. Sweet onions should be high in soluble solids and low in pyruvic acid.

Table 2. The marketable yield of eighteen Spanish onion varieties evaluated at the Horticulture Research Farm, Rock Springs, PA – 2018

Variety	Total MKT (Yield T/A) ^x	Avg. bulb (wt. – oz) ^y	% Large ^z
Aruba	12.47	13	64
Yosemite	9.96	12.23	54
Saffron	10.55	10.71	37
Rhino	8.89	10.89	32
Mondella	10.55	13.13	68
Scout	13.43	12.63	53
Candy	15.38	12.23	59
Yukon	12.30	13.77	61
Cherry Mountain	11.28	9.94	33
Cabernet	6.30	6.39	1
Monastrell	8.52	9.56	26
Rossa di Milano	9.02	9.04	23
Red Hawk	13.43	11.38	55
Red Mountain	11.47	10.11	37
Red Carpet	10.57	10.69	49
Diamond Swan	8.48	11.28	43
Lyrica	13.02	12.24	51
White Opera	11.56	11.58	49

X - The total marketable yield included all bulbs greater than 2.5 inches in diameter and is based on an onion population of 50,000 plants/A

Y - The average bulb weight in ounces included all bulbs greater than 2.5 inches in diameter

Z - The percent large bulbs included all onion bulbs greater than 3.0 inches in diameter.

Table 3. The cull numbers, soluble solids, and pungency rating of eighteen Spanish onion varieties evaluated at the Horticulture Research Farm, Rock Springs, PA – 2018

Variety	Total # of cull bulbs	% soluble solids ^Y	pungency ^Z
Aruba	0	8.2	2.7
Yosemite	1	7.8	2
Saffron	3	8.6	1.3
Rhino	2	7.1	1.7
Mondella	1	8.8	2.6
Scout	2	6.7	1.7
Candy	3	8.1	2.6
Yukon	0	6.8	2.1
Cherry Mountain	0	9.3	2
Cabernet	0	8.8	3.1
Monastrell	0	8.4	2.4
Rossa di Milano	2	9.6	3.2
Red Hawk	0	9	3.4
Red Mountain	5	9.8	4
Red Carpet	3	9.9	3.1
Diamond Swan	5	7.4	2.1
Lyrca	5	6.7	2.2
White Opera	2	8.1	2.5

Y - The percent soluble solids (sugars) as measured by Waters Agricultural Laboratories, Camilla, GA

Z - Pungency was measured by determining the pyruvic acid content of the bulb by Waters Agricultural Laboratories, Camilla, GA. Onions may be classified as to pungency according to the following scheme:

- very mild sweet onion.. ... 1- 4 mmoles pyruvic acid/kg weight of bulbs
- mild sweet onion..... ... 5- 7 mmoles
- intermediate pungency..... 8-10 mmoles
- pungent..11-15 mmoles
- very pungent.. >15 mmoles