
Friday through Saturday, January 11-12, 2008
Savannah International Trade Center Lower Concourse

VIDALIA ONION VARIETY TRIAL, 2007

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Onion variety trials continue to be an important part of the work at the Vidalia Onion and Vegetable Research Center. These trials have been underway since we've taken over the site in 1999. The information generated is used by growers, seed companies, and the Georgia Department of Agriculture to assess the suitability and performance of short-day onion varieties in southeast Georgia.

Materials and Methods

There were 49 varieties in the trial in the 2006-07 season. Plantbeds were sown on 18 Sept. 2006 in high density plantings of 60 seed/linear foot. Plantbeds were grown according to University of Georgia Cooperative Extension Service recommendations for plantbed onions (Boyhan et al., 2001).

Onions were transplanted on 20 Nov. 2006 to their final spacing of four rows on a prepared bed with 6 ft. between beds. Row spacing was 12 inches with a 5.5 inch in-row spacing. Plants were grown according to University of Georgia Cooperative Extension Service recommendations for weed, disease, and insect control, as well as overall fertility (Boyhan et al., 2001).

The experiment was a randomized complete block design with four replications. Each plot was 35 feet long with a 5 ft in-row alley. Twenty-five feet of each plot was harvested when deemed mature for that variety. Onions were pulled and layed on the ground for two days prior to clipping the tops and roots

from the bulbs. The bulbs were immediately weighed to determine total yield.

Weighed and bagged onions were then heat cured for 24 hours at 95 deg. F. at which time they were graded into jumbo and medium sizes. Jumbos were onion greater than or equal to 3 inches and mediums were greater than or equal to 2 inches and less than 3 inches in diameter. Cull onions included damaged, diseased or onions below 2 inches in size. Both jumbo and medium sized onion weights were recorded.

A 10-bulb sample was used to determine pungency using a pyruvate test as developed by Schwimmer and Weston (1961) and modified by Randle and Bussard (1993).

Results and Discussion

The most notable difference between this year and previous years is the amount of time taken to harvest the onions. In previous years varieties were harvested over a 24-35 day range. This year all the varieties were harvested over a 9 day period. This accelerated harvest schedule eliminated late season bacterial diseases that have plagued the trial in previous years. It should be noted, based on other experiments however, that the 2007 harvest season did not have a high pressure of bacterial diseases. It has been pointed out, however, that this accelerated harvest may not truly reflect the performance of these varieties or the conditions in the industry. For this reason next year we will again expand the harvest window for these varieties.

There were eight varieties that had total yield in excess of 1,000 50-lb bags per acre. These included NUN1002, Honeybee, SS2005, WI-129, NUN1003, WI-131, SS2011, and Sweet Harvest. All of these were harvested on the first harvest date. All of these varieties had better than 80% marketable onions except WI-129 and Sweet Harvest. These varieties were the top performers for jumbo yields as well, except for Sweet Harvest, which was replaced by Savannah Sweet. Only nine varieties had medium yields that exceeded 10% of the total marketable yield. The majority of varieties had medium yields that were well below 10% of total marketable yield.

Seedstem numbers ranged from 0-54 for a 35 ft plot. The highest number of seedstems was with Sweet Vidalia, which in recent years has had very high number of seedstems. This year had a significant number of seedstems compared to the previous year, but wasn't as bad as seedstems in 2004. There were six varieties that had no seedstems this year and they included, NUN 3005, J3002, Ponderosa, WI-129, XON-408Y, and NUN 1005.

Double numbers were comparable to 2006, but were much lower than 2005. There were eight varieties with more than 20 doubled

bulbs, but there were also 12 varieties that had no doubled bulbs this year.

The pyruvate analysis ranged from 3.4 to 6.7 um/gfw for the varieties in the trial. Overall this was slightly higher than for 2006 (2.8-6.3 um/gfw). The soluble solids (percent sugar) ranged from 8.5 to 12.2. These sugar values are slightly higher than for 2006, which had a range of 7.8 to 11.6%.

In conclusion the trial went very well with reasonably good yields for most varieties. Percent marketable yield was also very good across all the varieties. This may be due to the shorter harvest window this year.

Literature Cited

- Boyhan, G.E. et al. 2001. Onion production guide. Univ. of Ga. Bul. No. 1198.
- Randle, W.M. and M.L. Bussard. 1993. Streamlining onion pungency analyses. HortScience. 28: 60.
- Schwimmer, S. and W. Weston. 1961. Enzymatic development of pyruvic acid in onion as a measure of pungency. J. Sci. Food Chem. 9: 301-304.

Table 1. Variety trial yields, 2007.

| Number | Entry | Company | Color | Harvest Date | Total | Jumbos | Mediums | |
|---------------------------------|----------------|---------------------------|--------|--------------|---|--------|---------|-----|
| | | | | | Yield (50 lb bags/acre) | | | |
| 1 | J3001 | Bejo Seed Company | Yellow | 4/23/07 | 850 | 593 | 30 | |
| 2 | J3002 | Bejo Seed Company | Yellow | 4/24/07 | 729 | 573 | 31 | |
| 3 | J3003 | Bejo Seed Company | Yellow | 4/24/07 | 890 | 688 | 20 | |
| 4 | Sapelo Sweet | D. Palmer Seed Co. | Yellow | 4/19/07 | 845 | 631 | 77 | |
| 5 | Mr. Buck | D. Palmer Seed Co. | Yellow | 4/24/07 | 760 | 557 | 41 | |
| 6 | Georgia Boy | D. Palmer Seed Co. | Yellow | 4/24/07 | 841 | 611 | 45 | |
| 7 | Miss Megan | D. Palmer Seed Co. | Yellow | 4/24/07 | 691 | 491 | 37 | |
| 8 | Pinot Rouge | D. Palmer Seed Co. | Red | 4/19/07 | 637 | 464 | 98 | |
| 9 | Ohoopce Sweet | D. Palmer Seed Co. | Yellow | 4/19/07 | 748 | 559 | 55 | |
| 10 | YGH 105101 | Dessert Seed Co., Inc. | Yellow | 4/19/07 | 643 | 576 | 59 | |
| 11 | YGH 15085 | Dessert Seed Co., Inc. | Yellow | 4/24/07 | 548 | 426 | 35 | |
| 12 | YGH 15082 | Dessert Seed Co., Inc. | Yellow | 4/24/07 | 666 | 501 | 38 | |
| 13 | YGH 114101 | Dessert Seed Co., Inc. | Yellow | 4/24/07 | 626 | 462 | 33 | |
| 14 | YGH 108101 | Dessert Seed Co., Inc. | Yellow | 4/24/07 | 741 | 593 | 29 | |
| 15 | YGH 15094 | Dessert Seed Co., Inc. | Yellow | 4/24/07 | 698 | 509 | 40 | |
| 16 | HSX-61304F1 | Hortag Seed Co. | Yellow | 4/28/07 | 584 | 320 | 57 | |
| 17 | NUN3004 | Nunhems USA, Inc., CA | Red | 4/24/07 | 746 | 573 | 48 | |
| 18 | NUN3005 | Nunhems USA, Inc., CA | Red | 4/25/07 | 739 | 599 | 54 | |
| 19 | NUN3006 | Nunhems USA, Inc., CA | Red | 4/27/07 | 676 | 529 | 62 | |
| 20 | NUN1002 | Nunhems USA, Inc., CA | Yellow | 4/16/07 | 1167 | 1002 | 15 | |
| 21 | NUN1003 | Nunhems USA, Inc., CA | Yellow | 4/19/07 | 1050 | 875 | 37 | |
| 22 | NUN1004 | Nunhems USA, Inc., CA | Yellow | 4/24/07 | 802 | 676 | 35 | |
| 23 | NUN1005 | Nunhems USA, Inc., CA | Yellow | 4/24/07 | 744 | 585 | 42 | |
| 24 | NUN1006 | Nunhems USA, Inc., CA | Yellow | 4/24/07 | 810 | 647 | 28 | |
| 25 | Sweet Vidalia | Nunhems USA, Inc., ID | Yellow | 4/19/07 | 754 | 515 | 47 | |
| 26 | Sweet Caroline | Nunhems USA, Inc., ID | Yellow | 4/24/07 | 740 | 551 | 30 | |
| 27 | Caramelo | Nunhems USA, Inc., ID | Yellow | 4/24/07 | 774 | 568 | 24 | |
| 28 | Nirvana | Nunhems USA, Inc., ID | Yellow | 4/19/07 | 847 | 634 | 29 | |
| 29 | Mata Hari | Nunhems USA, Inc., ID | Red | 4/24/07 | 618 | 483 | 61 | |
| 30 | Sweet Jasper | Sakata Seed America, Inc. | Yellow | 4/24/07 | 694 | 501 | 41 | |
| 31 | Sweet Harvest | Sakata Seed America, Inc. | Yellow | 4/16/07 | 1001 | 652 | 55 | |
| 32 | XON-204Y | Sakata Seed America, Inc. | Yellow | 4/16/07 | 858 | 667 | 53 | |
| 33 | Ponderosa | Sakata Seed America, Inc. | Yellow | 4/19/07 | 749 | 596 | 39 | |
| 34 | XON-403Y | Sakata Seed America, Inc. | Yellow | 4/19/07 | 898 | 719 | 41 | |
| 35 | XON-408Y | Sakata Seed America, Inc. | Yellow | 4/19/07 | 815 | 713 | 40 | |
| 36 | Granex Yel PRR | Seminis Vegetable Seeds | Yellow | 4/24/07 | 675 | 408 | 93 | |
| 37 | Granex 33 | Seminis Vegetable Seeds | Yellow | 4/24/07 | 681 | 490 | 27 | |
| 38 | Savannah Sweet | Seminis Vegetable Seeds | Yellow | 4/24/07 | 880 | 728 | 23 | |
| 39 | Century | Seminis Vegetable Seeds | Yellow | 4/24/07 | 754 | 591 | 42 | |
| 40 | Pegasus | Seminis Vegetable Seeds | Yellow | 4/26/07 | 728 | 511 | 41 | |
| 41 | Golden Eye | Seminis Vegetable Seeds | Yellow | 4/24/07 | 768 | 621 | 33 | |
| 42 | Honeycomb | Shamrock Seed | Yellow | 4/16/07 | 691 | 474 | 83 | |
| 43 | Sugar Belle | Shamrock Seed | Yellow | 4/16/07 | 615 | 433 | 61 | |
| 44 | SSC 1535 F! | Shamrock Seed | Yellow | 4/16/07 | 843 | 596 | 52 | |
| 45 | Honeybee | Shamrock Seed | Yellow | 4/16/07 | 1138 | 936 | 30 | |
| 46 | SS2005 | Solar Seed Company | Yellow | 4/16/07 | 1125 | 950 | 106 | |
| 47 | SS2011 | Solar Seed Company | Yellow | 4/16/07 | 1012 | 820 | 30 | |
| 48 | WI-131 | Wannamaker Seed | Yellow | 4/16/07 | 1041 | 815 | 32 | |
| 49 | WI-129 | Wannamaker Seed | Yellow | 4/16/07 | 1071 | 772 | 29 | |
| ² Measured on 4/9/07 | | | | | Coefficient of variation | 9% | 10% | 50% |
| | | | | | Fisher's Protected LSD w/Bonferroni adjustment (p=0.05) | 138 | 117 | 41 |

Table 2. Seedstems, doubles, pungency, and soluble solids.

| Number | Entry | Seedstems ^z (No./35 ft plot) | Doubles ^z | Pungency um/gfw | Soluble Solids (%) |
|--------|--------------------------|--|----------------------|--------------------|-----------------------|
| 1 | J3001 | 4 | 2 | 4.8 | 9.1 |
| 2 | J3002 | 0 | 0 | 4.6 | 9.5 |
| 3 | J3003 | 30 | 0 | 4.7 | 9.5 |
| 8 | Pinot Rouge (red) | 5 | 1 | 4.1 | 12.2 |
| 9 | Ohoopee Sweet | 8 | 13 | 5.2 | 10.3 |
| 4 | Sapelo Sweet | 34 | 38 | 5.4 | 10.3 |
| 7 | Miss Megan | 5 | 3 | 4.5 | 9.3 |
| 5 | Mr. Buck | 16 | 3 | 4.8 | 9.5 |
| 6 | Georgia Boy | 25 | 6 | 5.1 | 9.7 |
| 10 | YGH 105101 | 19 | 1 | 5.4 | 9.9 |
| 11 | YGH 15085 | 1 | 0 | 4.6 | 9.5 |
| 12 | YGH 15082 | 1 | 1 | 5.0 | 9.3 |
| 14 | YGH 108101 | 13 | 0 | 5.4 | 9.2 |
| 15 | YGH 15094 | 6 | 1 | 4.5 | 9.3 |
| 13 | YGH 114101 | 29 | 3 | 5.0 | 9.2 |
| 16 | HSX-61304F1 | 14 | 5 | 5.5 | 9.7 |
| 20 | NUN1002 | 6 | 0 | 5.2 | 9.2 |
| 21 | NUN1003 | 19 | 24 | 4.5 | 9.4 |
| 23 | NUN1005 | 0 | 0 | 4.4 | 9.0 |
| 17 | NUN3004 (red) | 9 | 7 | 5.0 | 10.6 |
| 22 | NUN1004 | 2 | 0 | 4.1 | 9.4 |
| 24 | NUN1006 | 2 | 0 | 3.4 | 10.1 |
| 18 | NUN3005 (red) | 0 | 4 | 5.2 | 9.4 |
| 19 | NUN3006 (red) | 12 | 3 | 5.4 | 9.6 |
| 25 | Sweet Vidalia | 54 | 8 | 5.1 | 10.0 |
| 28 | Nirvana | 32 | 2 | 5.7 | 10.4 |
| 29 | Mata Hari (red) | 1 | 10 | 5.7 | 10.0 |
| 26 | Sweet Caroline | 8 | 1 | 4.7 | 10.1 |
| 27 | Caramelo | 16 | 0 | 4.6 | 9.8 |
| 32 | XON-204Y | 11 | 11 | 4.8 | 9.6 |
| 31 | Sweet Harvest | 19 | 10 | 5.4 | 9.1 |
| 33 | Ponderosa | 0 | 3 | 5.9 | 8.9 |
| 35 | XON-408Y | 0 | 6 | 5.2 | 9.6 |
| 34 | XON-403Y | 2 | 6 | 5.3 | 9.8 |
| 30 | Sweet Jaspe | 14 | 0 | 4.5 | 9.7 |
| 36 | Granex Yel PRR | 17 | 38 | 4.8 | 9.6 |
| 37 | Granex 33 | 3 | 7 | 5.3 | 9.5 |
| 39 | Century | 2 | 0 | 3.9 | 10.0 |
| 41 | Golden Eye | 5 | 2 | 4.6 | 9.4 |
| 38 | Savannah Sweet | 8 | 1 | 4.2 | 8.9 |
| 40 | Pegasus | 1 | 0 | 4.3 | 9.3 |
| 43 | Sugar Belle | 2 | 16 | 6.7 | 10.1 |
| 42 | Honeycomb | 21 | 13 | 4.8 | 11.1 |
| 44 | SSC 1535 F1 | 9 | 34 | 4.9 | 9.7 |
| 45 | Honeybee | 16 | 21 | 4.5 | 8.7 |
| 47 | SS2011 | 5 | 28 | 4.6 | 8.5 |
| 46 | SS2005 | 8 | 24 | 4.7 | 8.5 |
| 48 | WI-131 | 11 | 24 | 4.6 | 8.8 |
| 49 | WI-129 | 0 | 16 | 4.6 | 9.0 |
| | Coefficient of variation | 39% | 30% | 13% | 5% |
| | Fisher's Protected LSD | 4 | 1 | 1.1 | 0.8 |

w/Bonferroni adjustment (p=0.05)