EVALUATION OF ONION SPACING ON YIELD

G. E. Boyhan[1], Reid Torrance[2], Chris Hopkins[3], Randy Hill[4], and Thad Paulk[5]
University of Georgia Cooperative Extension
[1]Department of Horticulture, Statesboro, GA 30460
[2]Tattnall County Extension, Reidsville, GA 30453
[3]Toombs County Extension, Lyons, GA 30436
[4]Vidalia Onion and Vegetable Research Center, Lyons, GA 30436
[5]Vidalia Onion Research Laboratory, Tifton, GA 31793
gboyhan@uga.edu

Introduction

Onion production in many western states use plant populations in excess of 100,000 plants per acre, which can result in yields of 2,000 50-lb bags per acre or more. This is possible because of larger equipment (wider wheel spacing), which facilitates more plants per acre as well as more closely spaced rows. In some cases where onions are to be used for dehydration, shear tonnage is all that matters. In addition, with weather conditions generally dryer, closer spacing is possible without the concern of increased disease.

Although southeast Georgia does have high rainfall and humidity, which increases disease pressure along with the production of sweet onions which are more susceptible to diseases, with the advent of better disease control products it may be possible to increase plant population without adverse problems. In addition, because Vidalia onions are grown under center-pivot systems, growers generally grow onions behind onions increasing soil borne disease pressure. They cannot rotate their crops because of this limitation. Increasing plant populations may allow them to incorporate crop rotation and/or allow fields to lay fallow and recover from continuous cropping. This experiment was to evaluate different plant spacings and its effect on yield.

Materials and Methods

Varieties Century and Sapelo Sweet were transplanted on 6 Dec 2005. The experiment was a randomized complete block design with four replications. Each experimental unit was a 20 ft long bed planted to the various spacings.

The standard spacing for onions at the Vidalia Farm is a between-row spacing of 12 in. with an in-row spacing of 5.5 in. (Table 1). Four rows of onions with this spacing are planted on beds prepared with 6-ft. on-center spacing. A high density planting with between row spacing of 6 in. and in-row spacing of 5.5 in. was another treatment. Two low density plantings were also included. One had 12 in. between rows with 11 in. in-row spacing. The second low density planting had 5.5 in. in-row spacing and a 24 in. between row spacing.

Variety Sapelo Sweet was harvested on 11 May 2005, while ‘Century’ was harvested on 19 May 2005. Field or total weights were recorded immediately upon harvest and graded weights were recorded about one week later after curing. The graded sizes were jumbo at greater than or equal to 3 in. and mediums at greater than or equal to 2 in. and less than 3 in.

Results and Discussion

The highest yielding treatment for field or total yield was 171.5 lbs/plot with 'Century' at the high density planting. This represents over a 90% increase over either of the low-density plantings for 'Century', but represents only a 24% increase from the standard planting density for this variety.

For 'Sapelo Sweet' the high density planting represents more than a 44% increase over either of the low-density plantings for field yield. The high density planting, however, represents only a 4% increase over the standard planting density for this variety.

The highest jumbo yield for 'Century' was 116.6 lbs/plot. which was significantly higher than the standard spacing for this variety, 93.4 lbs/plot. In addition, both low-density plantings of 'Century' were significantly lower than either the high density or standard density plantings for this variety.

The highest jumbo yield for 'Sapelo Sweet' was with the standard planting density with a yield of 91.5 lbs/plot. This, however, was not significantly greater than the high density planting or the low density planting with 11 in. in-row spacing.

The highest yield of medium onions was with the high-density plantings. The high density 'Century' planting was significantly greater than the other planting densities for this variety. In addition, the high density planting of 'Sapelo Sweet' with 32.0 lbs/plot was significantly higher than the other planting densities for this variety.

The results of this experiment were somewhat disappointing. It was hoped that the high density planting would yield close to double the standard spacing. This would have allowed growers more management options such as crop rotation or fallowing land for disease management. These onions were harvested somewhat later than optimum, which may have adversely affected these results. We will continue this research, incorporating more varieties, as well as additional spacing schemes. The lower yields overall may also be reflected in the higher medium yields with the higher density planting. It may be possible to overcome some of these limitations with increased fertility, which will also be investigated.

Table 1. Onion spacing treatments.

Std.	Standard: 12 inch between row and 5.5 in. in-row (66 sq. in.)
HD1	High density: 6 inch between row and 5.5 in. in-row (33 sq. in.)
LD1	Low density 1: 12 in. between row and 11 in. in-row (132 sq. in.)
LD2	Low density 2: 24 in. between row and 5.5 in. in-row (132 sq. in.)

Table 2. Effect of onion spacing on field and graded yield.

Treatment	Field Yield	Jumbos (lbs/20-ft. plot)	Mediums
LD1 Century	86.7	46.8	1.8
LD2 Century	91.9	64.8	1.5
HD1 Century	171.5	116.6	13.1
Std Century	138.4	93.4	4.0
LD1 Sapelo Sweet	87.7	70.8	2.9
LD2 Sapelo Sweet	80.4	63.4	4.9
HD1 Sapelo Sweet	126.4	73.5	32.0
Std Sapelo Sweet	121.7	91.5	14.4
CV	22%	20%	53%
LSD (p=0.05)	36.3	23.0	7.2