2011 University of Delaware Spring Direct Seeded Onion Trials

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The 2011 Spring Direct Seeded Onion trials included 35 varieties from five participating seed companies. The purpose of the trial was to assess the feasibility of producing spring direct seeding onions in Delaware. Two varieties tested, Sherman and Forum, were planted as sets.

Varieties Entered in the 2011 Delaware Spring Direct Seeded Onion Trials

Variety	Description	Daylength	Company
Braddock	Northern	long	Bejo
Sherman*	Northern	long	Bejo
Delgado	Spanish	long	Bejo
Gunnison	Northern	long	Bejo
Bradley	Spanish	long	Bejo
Forum*		long	Bejo
Yankee	Northern	long	Bejo
Safrane	Northern	long	Bejo
Expression	Spanish	intermediate/long	Bejo
Sedona	Spanish	long	Bejo
Pontiac	storage	long	Crookham
Avalon	Spanish	intermediate	Crookham
Morpheus	Spanish	long	Crookham
Trigger	Spanish	long	Crookham
DPLD 1474	yellow storage/processing	long 40-50	DP seed
DPR 3071	red storage	long 40-50	DP seed
DPR 3073	red storage	long	DP seed
DPLD 2055	white	long	DP seed
DPLD 1476	yellow storage	long	DP seed
DPR 3072	red storage	long	DP seed
Ranchero	yellow, medium storage	long	Nunhems
Valero	Spanish	long	Nunhems
NUN7406	storage	long	Nunhems
NUN 7205	Western Export	long	Nunhems
Renegade	yellow	intermediate	Nunhems
Granero	yellow, medium storage	long	Nunhems
Vaquero	yellow, medium storage	long	Nunhems
Hendrix	yellow, long storage	long	Nunhems
Cimarron	yellow	intermediate	Nunhems
Pulsar	yellow, long storage	long	Nunhems
Arcero	yellow, medium storage	long	Nunhems
Montero	yellow, medium storage	long	Nunhems
Centerstone	Spanish	long	Takii
T-433	Spanish	long	Takii
Frontier	Spanish	long	Takii

*planted as sets

Location
Field 25-F at the University of Delaware Carvel REC Farm, Georgetown, DE.

First Planting
The first trial was planted on March 15, 2011 using a Monosem NG Plus4 Ultra Narrow Row vacuum planter. Between row spacing was 20 inches and in row spacing was approximately 1 inch. Pre-emergence herbicides Dacthol at 8 pt/A and Pre-Far at 6 qt/A, plus 80 lbs/A N in the form of 30% UAN were applied on March 17. A post-emergence application of Tapout at 16 oz/A was made on April 19 to control grass in the plot. The first planting was slow to emerge due to cold soil and crusting and despite pre and post emergence herbicide applications and attempts at cultivation this plot was abandoned because of excessive weed pressure.

Second Planting
The second trial was planted on April 14, 2011 using a Jang JP1 Clean Seeder. Four replications were planted but only some of the plot was taken to harvest, as explained below. Between row spacing was 20 inches and in row spacing was approximately 1 inch. Pre-emergence herbicides Dacthol at 8 pt/A and Pre-Far at 6 qt/A, plus 80 lbs/A N in the form of 30% UAN were applied on April 15. Emergence in the second planting was better for most varieties. Despite herbicide applications, weed control was an issue in this plot as well. The plot was hand cultivated several times, but all of replication 4, and parts of reps 1, 2 and 3 were abandoned because of weed pressure. We were able to keep weeds under control in the section of reps 1-3 that were taken to harvest. In the part of the plot that survived, stands were rated as good (3), fair (2) or poor (1) in July and average stand ratings are reported in Table 1. The plot was overhead irrigated weekly with a traveling linear system.

Table 1. Average Stand Rating for Each Variety

Variety	Stand Rating*	Variety	Stand Rating*
Sherman	3.0	Centerstone	1.5
DPR 3071	3.0	DPLD 2055	1.5
Forum	3.0	DPLD 1474	1.3
Pulsar	3.0	Gunnison	1.3
Sedona	3.0	DPLD 1476	1.3
NUN7406	2.3	Frontier	1.3
Pontiac	2.3	DPR 3072	1.3
Braddock	2.0	Avalon	1.3
Granero	2.0	Valero	1.0
Delgado	2.0	NUN 7205	1.0
Vaquero	2.0	Renegade	1.0
T-433	2.0	Hendrix	1.0
Bradley	2.0	DPR 3073	1.0
Arcero	2.0	Cimarron	1.0
Safrane	2.0	Montero	1.0
Trigger	1.7	Expression	1.0
Yankee	1.7	Morpheus	1.0
Ranchero	1.5		

* stands were rated as good=3, fair=2, poor=1

The two varieties planted as sets, Sherman and Forum, produced good stands as well as a few of the direct seeded varieties, DPR 3071, Pulsar and Sedona. A number of the varieties, however, produced only poor stands.

Plots were harvested when more than 50% of the tops had fallen over. A 15 ft portion of each plot was pulled by hand. The harvest sample was dried on a covered porch for approximately six days, graded by size, topped and weighed.

Days to harvest, and number and weight of onions >2 inches in diameter are reported in Table 2. Sherman was the only variety to produce bulbs with a diameter of 3.25 inches or greater. Of the direct seeded varieties, DPR 3071 produced the largest onions and Sedona produced the highest yield of bulbs >2 inches.

Table 2. Average Days to Harvest and Yield of Onions >2 Inches in Diameter

Variety	# of Plots Harvested	Days to Harvest	Per 15 ft Plot		Per Acre	
			Number	Weight (lbs)	Number	Weight (lbs)
Forum*	2	117	25.5	6.07	44343	10555
Sherman*	4	117	12.3	3.86	21302	6704
Sedona	2	141	10.5	2.14	18259	3721
NUN7406	2	131	8.0	1.49	13911	2591
Delgado	1	131	7.0	1.40	12172	2434
Pulsar	2	131	7.0	1.31	12172	2278
Avalon	2	131	6.5	1.03	11303	1791
Vaquero	1	131	6.0	1.20	10434	2087
Pontiac	2	141	5.5	1.21	9564	2104
Ranchero	1	131	5.0	0.86	8695	1495
Granero	2	131	5.0	1.07	8695	1861
DPLD 2055	1	131	5.0	0.80	8695	1391
Braddock	2	141	3.0	0.52	5217	904
DPR 3071	2	151	3.0	0.71	5217	1235
Hendrix	1	151	3.0	0.50	5217	869
Bradley	1	151	3.0	0.46	5217	800
Arcero	2	141	3.0	0.53	5217	922
Trigger	2	151	2.5	0.52	4347	904
DPLD 1474	2	151	2.5	0.51	4347	887
Centerstone	2	141	2.0	0.37	3478	643
DPLD 1476	1	151	2.0	0.40	3478	696
Cimarron	1	151	2.0	0.56	3478	974
Montero	1	131	2.0	0.28	3478	487
Yankee	1	151	2.0	0.36	3478	626
Gunnison	2	141	1.5	0.30	2608	522
Safrane	1	151	1.0	0.20	1739	348
Renegade	1	131	0.0	0.00	0	0
DPR 3073	1	151	0.0	0.00	0	0
T-433	1	151	0.0	0.00	0	0
Frontier	2	141	0.0	0.00	0	0
Expression	1	151	0.0	0.00	0	0
DPR 3072	2	151	0.0	0.00	0	0

*planted as sets

Discussion

There are many issues with spring direct seeded onion production in Delaware that remain unresolved.

Cold soils and a tendency to crust can slow, or totally impede emergence in plots planted extremely early. This compounds weed control issues because many postemergence herbicides cannot be applied until the onions reach the two or three true leaf stage. Planting in extremely sandy or high organic matter sites, or the addition of large amounts of compost or other organic matter could help to resolve some of the emergence issues. Fields with known weed problems will need to be avoided.

Irrigation in the trial was probably inadequate given the low water holding capacity and tendency to crust at the site. Better irrigation management might be achieved through any of the following: use of drip irrigation, choosing sites with higher organic matter and more water holding capacity.

Spacing was an issue for some of the varieties that had very good stands, as the onions ended up being too close together to size properly. More work will need to be done to determine the spacing needed to achieve the size of bulb desired.

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