

**UNIVERSITY OF
DELAWARE**



LIMA BEAN

VARIETY

TRIAL

RESULTS

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2005

2005 University of Delaware Lima Bean Variety Trial

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The 2005 Lima Bean Variety Trial included seventeen varieties from two participating companies: ADM Edible Bean Specialties, Inc. and Ben Fish & Son. The purpose of this trial is to evaluate new processing lima bean varieties for yield, maturity, and quality under Delaware growing conditions.

Varieties Entered in the 2005 Delaware Lima Bean Variety Trail

Variety Name	Days to Maturity	Company
1 - Cypress	77	ADM Edible Bean Specialties, Inc.
2 - Meadow	76	ADM Edible Bean Specialties, Inc.
3 - 4LCTS.2	77	ADM Edible Bean Specialties, Inc.
4 - 1LD3	77	ADM Edible Bean Specialties, Inc.
5 - 1LD4	77	ADM Edible Bean Specialties, Inc.
6 - 3L902	77	ADM Edible Bean Specialties, Inc.
7 - 3L907	79	ADM Edible Bean Specialties, Inc.
8 - GBL Cel-Sel	84	Ben Fish & Son
9 - GBL 14-01-DA	78	Ben Fish & Son
10 - GBL 22-04-DA	84	Ben Fish & Son
11 - GBL 21-04-DA	84	Ben Fish & Son
12 - GBL 184-85	88	Ben Fish & Son
13 - GBL 24-04-DA	81	Ben Fish & Son
14 - GBL 2-01-DA	84	Ben Fish & Son
15 - GBL 27-04-DA	84	Ben Fish & Son
16 - GBL 23-04-DA	84	Ben Fish & Son
17 - GBL 28-04-DA	84	Ben Fish & Son

Location:

Field 25-E at the University of Delaware Research and Education Center Farm, Georgetown, DE

Cultural Practices:

The trial was planted on June 9, 2005 with a Monosem planter. Varieties were planted in four-row plots with 30 inch between row spacing and 3 inch in-row spacing. Plots were 25 feet in length. Plots were arranged in a randomized complete block design with four replications. The field was fertilized according to soil test results. Starter nitrogen fertilizer, at a rate of 11 gal./A of 30% UAN, and Ridomil Gold PC GR, at a rate of 13 lbs/A were applied at planting. Pre-emergence herbicides (1 oz./A Pursuit 70DG + 1.5 pints/A Dual II Magnum + 25 gal./A 30% UAN) were applied on June 11, 2005. Plots were irrigated regularly with a traveling, linear system. No applications were made for insect or disease control.

Harvest:

To determine maturity and decide when to harvest, ten plants were pulled from each variety in replication II and the number of flat, full and dry pods determined. Varieties were harvested as close to ten percent dry pods as possible. All replications for a variety were harvested on the same day. Harvest began on August 24 and ended on August 29.

A 20 foot section of one row from each plot was harvested using a Picks-All single row harvester. The beans were shelled in a Taylor Manufacturing Company, TaMaCo Huller, Model 520. Trash was removed from the shelled beans by hand, and the cleaned beans were weighed to determine yield. A comparison of machine and hand harvest indicates that machine harvest results in an average of 20% harvest loss.

Results and Discussion

Yields differed significantly among the varieties as shown in Table 1. GBL 24-04-DA, GBL 27-04-DA and GBL 21-04-DA were the top three highest yielding varieties in the trial. These three varieties yielded significantly better than Cypress, but not significantly better than GBL Cel-Sel or GBL 184-85.

High temperatures in early August (See Appendix A) caused a split set in some varieties, and resulted in a higher than desirable percentage of dry pods at harvest.

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Table 1: Yield, Days to Harvest and Maturity at Harvest for Entries in the 2005 Lima Bean Variety Trial

Variety Name	Yield (lbs/A) ¹	Expected Days to Harvest	Observed Days to Harvest	% of Pods in Each Category at Harvest ²		
				% Filled	% Dry	% Flat
GBL 24-04-DA	2509 a	81	81	83.2%	1.9%	14.9%
GBL 27-04-DA	2407 ab	84	81	72.6%	2.7%	24.8%
GBL 21-04-DA	1997 abc	84	81	78.4%	12.7%	8.8%
GBL 23-04-DA	1961 abc	84	76	77.1%	0.0%	22.9%
GBL 22-04-DA	1905 abc	84	81	76.0%	20.0%	4.0%
GBL 28-04-DA	1865 abc	84	76	79.3%	0.4%	20.3%
GBL 184-85	1859 abc	88	81	86.9%	9.7%	3.4%
GBL Cel-Sel	1741 abcd	84	81	.	.	.
1LD3	1593 bcde	77	81	71.7%	26.1%	2.2%
1LD4	1581 cde	77	78	63.1%	22.9%	14.0%
Meadow	1562 cde	76	76	45.1%	14.3%	40.6%
3L902	1336 cde	77	78	63.7%	10.1%	26.1%
4LCTS.2	1222 cde	77	81	69.9%	27.4%	2.7%
Cypress	1002 de	77	81	61.7%	31.9%	6.4%
GBL 14-01-DA	919 de	78	81	75.0%	10.3%	14.7%
GBL 2-01-DA	910 e	84	81	63.8%	0.0%	36.2%
3L907	900 e	79	81	70.1%	29.9%	0.0%

¹*p*-value for variety = 0.0039, means followed by the same letter are not significantly different

²based on a sample of ten plants pulled from replication II

Table 2: Stand Counts for Each Entry in the 2005 Lima Bean Variety Trial, June 29, 2005 (20 DAP)

Variety Name	Plants/Yard ¹
Cypress	12.00 a
4LCTS.2	11.38 ab
3L902	11.12 abc
GBL 23-04-DA	10.88 abc
Meadow	10.75 abc
1LD4	10.75 abc
1LD3	10.63 abcd
GBL 22-04-DA	10.00 bcde
GBL 21-04-DA	9.75 bcde
GBL 24-04-DA	9.63 cdef
GBL 184-85	9.38 cdef
3L907	9.25 cdefg
GBL 14-01-DA	8.75 defg
GBL Cel-Sel	8.63 efg
GBL 28-04-DA	8.63 efg
GBL 27-04-DA	7.75 fg
GBL 2-01-DA	7.38 g

¹p-value for stand count = 0.0004, means followed by the same letter are not significantly different

Table 3: Days to Flowering for Entries in the 2005 Lima Bean Variety Trial

Variety Name	Began Flowering (DAP)	Began Full Flower (DAP)
Cypress	34	50
Meadow	34	50
4LCTS.2	34	50
1LD3	34	50
1LD4	34	50
3L902	34	50
3L907	34	50
GBL Cel-Sel	39	55
GBL 14-01-DA	34	50
GBL 22-04-DA	34	50
GBL 21-04-DA	41	53
GBL 184-85	41	55
GBL 24-04-DA	41	53
GBL 2-01-DA	41	57
GBL 27-04-DA	41	53
GBL 23-04-DA	41	53
GBL 28-04-DA	41	53

Appendix A: Weather Data for June, July and August, 2005

June 2005

Day	Julian Day	Max Temp °F	Min Temp °F	Rainfall (in.)	Max Soil Temp °F	Min Soil Temp °F
1	152	72.00	51.01	0.00	94.39	54.28
2	153	61.84	55.18	0.00	74.64	59.67
3	154	63.84	57.78	1.35	68.63	60.01
4	155	73.60	61.25	0.00	76.64	61.92
5	156	85.57	58.91	0.01	93.79	59.72
6	157	89.78	64.58	0.48	101.88	64.71
7	158	86.32	67.28	0.30	95.20	67.23
8	159	91.74	68.14	0.00	104.74	67.55
9	160	87.66	69.26	0.00	102.99	69.82
10	161	85.57	70.88	0.17	92.89	70.41
11	162	86.56	68.90	0.00	100.67	68.22
12	163	86.56	68.52	0.00	98.08	68.50
13	164	88.30	72.46	0.00	102.74	71.71
14	165	91.53	75.07	0.00	105.64	74.30
15	166	89.04	71.24	0.00	105.48	74.14
16	167	87.55	65.07	0.02	106.41	67.82
17	168	78.53	58.41	0.00	97.09	61.97
18	169	79.39	53.60	0.00	99.61	59.14
19	170	74.08	59.04	0.00	90.14	62.69
20	171	68.99	52.36	0.00	81.50	58.60
21	172	80.62	48.27	0.00	102.61	53.94
22	173	81.61	63.07	0.24	96.04	65.14
23	174	77.52	60.75	0.01	97.77	63.72
24	175	85.44	59.52	0.00	102.20	64.20
25	176	87.04	62.83	0.00	104.83	64.90
26	177	84.69	65.44	0.00	102.04	68.65
27	178	77.43	70.74	0.99	82.80	72.66
28	179	90.03	71.51	0.02	98.71	72.05
29	180	79.03	72.10	0.26	84.87	71.13
30	181	85.44	70.12	0	94.64	69.944
Average		81.89	63.25		95.72	65.27
Total				3.59		
Year to Date Average		59.00	40.21		64.28	43.31
Total				21.15		

July 2005

Day	Julian Day	Max Temp °F	Min Temp °F	Rainfall (in.)	Max Soil Temp °F	Min Soil Temp °F
1	182	87.19	68.65	0.00	97.03	70.59
2	183	82.26	68.02	0.00	91.33	70.70
3	184	78.53	64.45	0.00	97.61	67.28
4	185	82.24	62.47	0.00	102.72	65.28
5	186	86.81	68.14	0.01	101.79	70.54
6	187	83.46	70.74	0.38	94.84	71.92
7	188	74.70	68.04	0.01	80.04	70.00
8	189	79.32	64.94	1.99	86.59	66.78
9	190	85.35	61.25	0.00	98.08	63.39
10	191	87.80	64.94	0.00	103.15	66.25
11	192	88.90	64.58	0.00	104.83	67.39
12	193	93.31	66.43	0.00	108.12	69.48
13	194	87.89	73.08	0.00	102.92	76.48
14	195	84.45	71.73	0.28	91.24	73.76
15	196	85.82	72.97	0.10	98.74	73.90
16	197	86.32	73.69	0.87	98.38	76.71
17	198	89.91	75.45	0.00	97.34	75.78
18	199	90.77	75.43	0.00	102.54	75.72
19	200	91.96	76.17	0.00	103.80	77.22
20	201	90.36	72.97	0.00	105.67	77.18
21	202	91.62	68.40	0.00	106.97	73.36
22	203	90.88	73.33	0.00	107.35	76.33
23	204	86.94	67.28	0.00	103.93	75.25
24	205	87.66	62.22	0.00	107.37	69.24
25	206	88.27	68.90	0.36	96.55	71.47
26	207	95.04	74.08	0.08	104.81	75.83
27	208	97.03	73.44	0.68	108.75	75.49
28	209	83.10	68.77	0.00	96.28	72.41
29	210	78.66	69.13	0.17	83.84	73.63
30	211	78.53	69.51	0.03	86.18	72.36
31	212	79.77	68.14	0.00	87.24	70.41
Average		86.78	69.30		99.40	72.05
Total				4.93		
Year to Date Average Total		63.0	44.5	26.11	69.29	47.51

August 2005

Day	Julian Day	Max Temp °F	Min Temp °F	Rainfall (in.)	Max Soil Temp °F	Min Soil Temp °F
1	213	85.57	69.64	0.00	101.64	70.61
2	214	90.86	67.41	0.00	104.61	70.57
3	215	90.73	73.20	0.00	105.10	75.27
4	216	93.58	68.04	0.00	106.72	73.31
5	217	92.97	72.84	0.00	104.38	75.09
6	218	86.77	71.24	0.01	101.25	75.79
7	219	84.09	70.97	0.03	92.77	74.66
8	220	88.18	71.98	0.00	98.92	73.89
9	221	76.00	69.00	0.40		
10	222	84.00	71.00	0.20		
11	223	92.00	71.00	0.00		
12	224	92.97	76.93	0.00	102.92	79.27
13	225	93.45	75.69	0.00	103.19	76.26
14	226	92.46	76.17	0.00	102.90	76.98
15	227	88.66	73.58	0.00	103.77	76.69
16	228	80.51	71.37	0.17	90.70	74.52
17	229	84.58	66.56	0.11	95.49	70.99
18	230	87.76	62.71	0.00	102.70	67.28
19	231	79.03	71.11	0.10	81.36	73.96
20	232	88.00	68.77	0.01	97.02	70.63
21	233	91.99	72.59	0.00	99.45	75.20
22	234	88.05	65.93	0.00	100.26	70.20
23	235	82.85	64.81	0.00	90.88	69.49
24	236	82.13	61.72	0.00	97.30	66.49
25	237	81.27	55.83	0.00	97.68	64.26
26	238	79.03	58.28	0.00	88.29	66.22
27	239	79.03	65.19	0.09	82.06	70.20
28	240	87.53	70.50	0.01	94.87	72.21
29	241	86.56	67.05	0.00	99.21	70.75
30	242	85.33	73.11	0.01	89.85	75.54
31	243	87.93	73.20	0.00	92.86	75.22
Average		86.57	69.00		97.90	72.34
Total				1.13		
Year to Date Average Total		66.00	47.63	27.25	72.58	50.43