

**UNIVERSITY OF  
DELAWARE**



# LIMA BEAN

**VARIETY**

**TRIAL**

**RESULTS**

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**2006**

## 2006 University of Delaware Lima Bean Variety Trial

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The 2006 Lima Bean Variety Trial included 23 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 2006 Delaware Lima Bean Variety Trail

Variety Name	Days to Maturity	Company
G200394	Cypress + 0	ADM Edible Bean Specialties, Inc.
G200381	Cypress - 1	ADM Edible Bean Specialties, Inc.
G200384	Cypress + 0	ADM Edible Bean Specialties, Inc.
G200385	Cypress + 0	ADM Edible Bean Specialties, Inc.
G200382	Cypress + 0	ADM Edible Bean Specialties, Inc.
G200472	Cypress + 2	ADM Edible Bean Specialties, Inc.
G200430	Cypress + 4	ADM Edible Bean Specialties, Inc.
G200410	Cypress + 2	ADM Edible Bean Specialties, Inc.
G200476	Cypress + 2	ADM Edible Bean Specialties, Inc.
LD3	Cypress + 0	ADM Edible Bean Specialties, Inc.
LD4	Cypress + 0	ADM Edible Bean Specialties, Inc.
Cypress	Cypress + 0	ADM Edible Bean Specialties, Inc.
Maestro	Cypress + 0	ADM Edible Bean Specialties, Inc.
Meadow	Cypress + 0	ADM Edible Bean Specialties, Inc.
GBL 21-04-DA	81	Ben Fish & Son
GBL 22-04-DA	81	Ben Fish & Son
GBL 23-04-DA	76	Ben Fish & Son
GBL 25-04-DA	78	Ben Fish & Son
GBL 26-04-DA	78	Ben Fish & Son
GBL 27-04-DA	81	Ben Fish & Son
GBL 24-04-DA	81	Ben Fish & Son
184-85	81	Ben Fish & Son
C-elite Select	81	Ben Fish & Son

#### Location:

Field 27-B at the University of Delaware Research and Education Center Farm, Georgetown, DE

#### Cultural Practices:

The trial was planted on June 13, 2006 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 10 gal./A of 30% UAN, and Ridomil Gold PC GR, at a rate of 13 lbs/A were applied at planting. Pre-emergence herbicides (3 oz./A Pursuit + 1.5 pints/A Dual II Magnum) were applied on June 16, 2006. Portions of the field were flooded as a result of 7.6 inches of rain that fell over four days from June 25 to June 28. Flooding damaged parts of replications three and four. Plots were cultivated on July 3, 2006 and July 10, 2006 to alleviate soil compaction that resulted from the heavy rains. Nitrogen in the form of 30% UAN was applied on July 10<sup>th</sup> at a rate of 15 gal/A. Plots were irrigated, when necessary, with a traveling, linear system. No applications were made for insect or disease control.

### **Harvest:**

To determine maturity and decide when to harvest, five plants were pulled from each variety in replication I and the number of flat, full and dry pods determined. Varieties were harvested as close to ten percent dry pods as possible. Only three of the four replications were harvested due to severe flooding damage to replication IV. Except where noted, all replications for a variety were harvested on the same day. Harvest began on August 28 (76 DAP) and ended on September 5 (84 DAP).

One 25-foot 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. However there was no significant difference among the 14 highest yielding varieties in the trial. The standard varieties Cypress and C-elite Select were among the 14 highest yielding varieties. There was a period of extremely hot temperatures in early August. Although this weather occurred during flowering, final yields of varieties flowering during this time were not uniformly affected across varieties (Table 3).

### **Acknowledgements**

The authors gratefully acknowledge the assistance of James Adkins who maintains and runs the harvester, and our student summer workers, Akela Marsh, Ashley Vent, Ryan Pepper and Morgan Ellis. We also thank Vic Green and the REC Farm Crew.

**Table 1: Yield, Days to Harvest and Maturity at Harvest for Entries in the 2006 Lima Bean Variety Trial**

Variety Name	Yield (lbs/A) <sup>1</sup>	Expected Days to Harvest	Observed Days to Harvest <sup>2</sup>	% of Pods in Each Category at Harvest <sup>3</sup>		
				% Filled	% Dry	% Flat
G200430	3228 a	80	76	50.4	41.7	7.9
Cypress	3217 ab	76	76	67.5	20.6	11.9
GBL 21-04-DA	3207 abc	81	84	50.3*	49.7	0.0
G200385	3017 abc	76	78*	74.0	6.5	19.5
LD4	2957 abcd	76	76	76.6	9.7	13.8
G200476	2929 abcd	78	78	65.8	27.3	6.8
Maestro	2869 abcde	76	76	72.1	15.5	12.4
GBL 23-04-DA	2510 abcdef	76	84	71.9*	27.6	0.5
Meadow	2431 abcdef	76	78	50.0	14.8	35.2
G200381	2430 abcdef	75	76	75.8	17.0	7.3
C-elite Select	2342 abcdef	81	84	68.1*	30.0	1.9
G200382	2308 abcdef	76	76	64.6	21.8	13.6
GBL 27-04-DA	2246 abcdefg	81	84	79.3*	14.9	5.9
LD3	2150 abcdefg	76	76	68.1	28.4	3.4
G200472	2136 bcdefg	78	79	68.3	30.3	1.4
G200384	2117 cdefg	76	78	69.0	5.8	25.2
184-85	1916 defg	81	84	62.9*	37.1	0.0
G200410	1805 efg	78	76	80.0	14.0	6.0
G200394	1703 fg	76	76*	38.8	13.2	47.9
GBL 24-04-DA	1703 fg	81	79	79.1	17.6	3.2
GBL 22-04-DA	1622 fg	81	79	84.9	12.1	3.0
GBL 25-04-DA	1535 fg	78	84	67.5*	30.3	2.2
GBL 26-04-DA	1202 g	78	79*	76.6	11.7	11.7

<sup>1</sup>*p*-value for variety = 0.0069, means followed by the same letter are not significantly different

<sup>2</sup>replication III of the starred varieties was harvested 84 DAP

<sup>3</sup>based on a sample of five plants pulled from replication I; samples were taken on the same day as harvest except for starred varieties, which were sampled 79 DAP

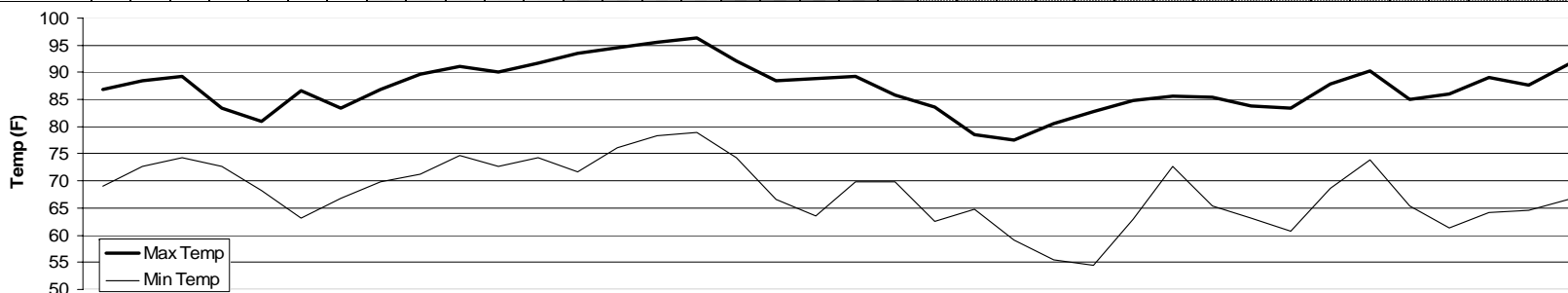
**Table 2: Stand Counts for Each Entry in the 2006 Lima Bean Variety Trial, June 22, 2005  
(9 DAP)**

Variety Name	Plants/Yard <sup>1</sup>	
LD3	12.00	a
G200385	11.75	ab
Cypress	11.50	abc
G200384	11.38	abc
LD4	11.38	abc
G200476	11.13	abcd
G200381	11.00	abcd
G200472	10.88	abcd
G200430	10.88	abcd
G200410	10.75	abcd
C-elite Select	10.63	abcd
G200394	10.50	abcd
G200382	10.50	abcd
GBL 21-04-DA	10.25	bcde
GBL 22-04-DA	10.00	cdef
Meadow	9.88	cdef
184-85	9.63	defg
Maestro	9.50	defg
GBL 27-04-DA	8.75	efgh
GBL 23-04-DA	8.50	fgh
GBL 25-04-DA	8.13	gh
GBL 26-04-DA	8.13	gh
GBL 24-04-DA	7.25	h

<sup>1</sup>p-value for stand count < 0.0001, LSD=1.632, means followed by the same letter are not significantly different

**Table 3: Days to Flowering for Entries in the 2006 Lima Bean Variety Trial**

Variety (ordered by yield)	Days After Planting (Flowering was evaluated on starred days.)																																					
	*			*				*			*				*				*				*				*		*									
					40																									70		*						
G200430																																						
Cypress																																						
GBL 21-04-DA																																						
G200385																																						
LD4																																						
G200476																																						
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GBL 23-04-DA																																						
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GBL 27-04-DA																																						
LD3																																						
G200472																																						
G200384																																						
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G200410																																						
G200394																																						
GBL 24-04-DA																																						
GBL 22-04-DA																																						
GBL 25-04-DA																																						
GBL 26-04-DA																																						



=no flowering  
  =first flowers  
  =increasing flower  
  =increasing/full flower  
  =full/decreasing flowers  
  =decreasing flowers

**Appendix A: Weather Data for 2006 Lima Variety Trial  
June 13<sup>th</sup> (planting) to September 5<sup>th</sup> (final harvest)**

<b>DAP</b>	<b>Date</b>	<b>Max Temp °F</b>	<b>Min Temp °F</b>	<b>Rainfall (in.)</b>	<b>Max Soil Temp °F</b>	<b>Min Soil Temp °F</b>
0	13-Jun	80.02	54.21	0.00	78.17	61.90
1	14-Jun	67.05	61.12	0.29	70.29	66.02
2	15-Jun	80.89	60.26	0.00	76.41	64.24
3	16-Jun	84.22	53.83	0.00	79.07	63.00
4	17-Jun	84.72	57.43	0.00	80.28	65.93
5	18-Jun	88.18	64.72	0.00	82.44	68.49
6	19-Jun	86.22	68.52	0.28	82.62	72.21
7	20-Jun	85.23	68.41	0.29	83.34	72.27
8	21-Jun	87.67	64.94	0.00	84.13	71.13
9	22-Jun	89.65	67.55	0.00	82.49	72.32
10	23-Jun	80.38	68.67	0.58	78.78	73.58
11	24-Jun	83.01	69.53	0.02	79.16	72.50
12	25-Jun	82.40	68.41	5.26	77.14	69.49
13	26-Jun	82.53	71.76	0.07	80.01	73.17
14	27-Jun	81.55	73.26	1.20	79.48	74.52
15	28-Jun	85.23	73.36	1.06	83.52	73.76
16	29-Jun	86.59	70.27	0.00	85.69	75.06
17	30-Jun	81.63	64.20	0.00	82.74	73.22
18	1-Jul	85.08	62.98	0.00	83.98	71.26
19	2-Jul	90.37	66.81	0.00	85.50	72.30
20	3-Jul	89.78	69.26	0.52	88.68	75.16
21	4-Jul	91.27	70.75	0.46	88.84	76.69
22	5-Jul	85.71	71.24	0.66	86.68	75.51
23	6-Jul	74.86	64.71	0.37	77.65	72.66
24	7-Jul	78.53	59.27	0.00	82.80	67.84
25	8-Jul	77.92	61.00	0.00	81.43	69.55
26	9-Jul	81.39	59.27	0.00	83.32	68.07
27	10-Jul	86.09	64.20	0.00	85.86	69.75
28	11-Jul	89.04	72.36	0.00	90.57	73.96
29	12-Jul	89.29	73.72	0.02	91.04	76.24
30	13-Jul	86.09	74.44	0.00	84.94	77.32
31	14-Jul	83.48	72.73	0.25	87.13	76.51
32	15-Jul	85.48	71.11	0.06	84.81	76.30
33	16-Jul	90.16	72.01	0.00	90.28	75.27
34	17-Jul	96.42	69.78	0.00	97.99	75.38
35	18-Jul	96.67	72.72	0.01	100.47	78.37
36	19-Jul	86.81	69.01	0.00	97.02	77.79
37	20-Jul	88.54	72.72	0.00	92.93	78.91
38	21-Jul	89.29	74.21	0.00	94.82	79.07
39	22-Jul	83.48	72.59	1.37	84.63	76.26
40	23-Jul	81.01	68.16	0.32	81.93	74.79
41	24-Jul	86.59	63.09	0.00	88.16	70.95
42	25-Jul	83.48	66.81	0.00	85.24	72.10
43	26-Jul	86.79	69.89	0.00	92.28	74.89
44	27-Jul	89.65	71.24	0.00	92.17	75.97
45	28-Jul	91.02	74.71	0.16	94.21	78.40
46	29-Jul	90.03	72.73	0.00	90.54	77.02

<b>DAP</b>	<b>Date</b>	<b>Max Temp °F</b>	<b>Min Temp °F</b>	<b>Rainfall (in.)</b>	<b>Max Soil Temp °F</b>	<b>Min Soil Temp °F</b>
47	30-Jul	91.76	74.34	0.00	92.43	78.40
48	31-Jul	93.47	71.62	0.20	94.37	78.96
49	1-Aug	94.46	76.06	0.00	91.53	80.01
50	2-Aug	95.45	78.40	0.00	91.40	81.39
51	3-Aug	96.30	78.91	0.01	92.66	82.40
52	4-Aug	92.14	74.21	0.00	91.69	82.44
53	5-Aug	88.43	66.69	0.00	89.74	78.82
54	6-Aug	88.77	63.48	0.00	87.22	76.64
55	7-Aug	89.26	69.78	0.34	85.84	77.65
56	8-Aug	85.84	69.78	0.00	84.11	77.65
57	9-Aug	83.59	62.47	0.00	84.87	73.00
58	10-Aug	78.55	64.83	0.00	79.32	74.48
59	11-Aug	77.54	59.14	0.00	80.92	74.62
60	12-Aug	80.51	55.45	0.00	80.89	70.05
61	13-Aug	82.74	54.46	0.00	81.14	69.76
62	14-Aug	84.85	63.00	0.00	81.63	71.80
63	15-Aug	85.71	72.61	0.00	81.81	75.69
64	16-Aug	85.48	65.46	0.00	82.80	75.04
65	17-Aug	83.86	63.09	0.00	82.44	73.47
66	18-Aug	83.48	60.76	0.00	80.33	72.82
67	19-Aug	87.80	68.67	0.00	84.09	74.93
68	20-Aug	90.28	73.83	0.00	84.85	77.58
69	21-Aug	84.96	65.32	0.22	82.99	73.76
70	22-Aug	85.95	61.25	0.00	82.83	71.56
71	23-Aug	89.04	64.09	0.00	85.39	72.97
72	24-Aug	87.66	64.58	0.00	85.51	73.87
73	25-Aug	91.53	66.56	0.00	86.18	74.50
74	26-Aug	85.82	71.11	0.00	85.55	76.78
75	27-Aug	88.45	74.84	0.00	86.11	78.26
76	28-Aug	88.92	73.47	0.04	84.02	78.84
77	29-Aug	91.87	73.11	0.13	87.67	77.86
78	30-Aug	75.33	67.69	0.02	81.28	74.32
79	31-Aug	73.51	67.30	0.01	75.38	71.46
80	1-Sep	68.81	64.72	4.23	71.46	65.79
81	2-Sep	70.20	61.27	0.34	70.03	66.38
82	3-Sep	73.36	57.58	0.01	71.76	65.32
83	4-Sep	80.04	62.73	0.00	76.5	67.69
84	5-Sep	71.04	62.49	0.73	72.01	69.01