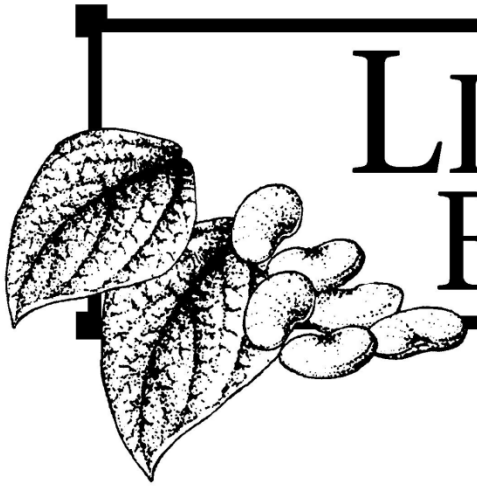
UNIVERSITY OF DELAWARE



# LIMA BEAN

## VARIETY TRIAL RESULTS

## 2014

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# 2014 UNIVERSITY OF DELAWARE GREEN BABY LIMA BEAN AND FORDHOOK LIMA BEAN VARIETY TRIALS

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## 2014 Baby Lima Bean Variety Trials

In 2014 two trials of baby lima varieties were planted at the University of Delaware Research Farm in Georgetown, Delaware. One trial was irrigated and the other was not.

### Unirrigated Baby Lima Bean Variety Trial at Georgetown, DE- Planted May 29, 2014

The Unirrigated Baby Lima Bean Variety Trial included a total of 33 lines and was planted on May 29. The purpose of this trial was to evaluate advanced breeding material from the UD Lima Bean Breeding Program that had been selected under dryland conditions. This trial was not irrigated and was planted in late May expose the entries to heat stress during flowering. Trial entries were evaluated for yield and days to harvest.

***Trial Location:***

Field Dill-6 at the University of Delaware Research and Education Center Farm, Georgetown, DE

***Plot Setup and Cultural Practices:***

The trial was planted by hand on May 29, 2014 into rows marked with a Monosem planter. Some of the seed was treated, and some was not, as indicated in the results section. Varieties were planted in one-row plots with 30 inch between row spacing and 3 inch in-row spacing. Plots were 15 feet in length. The variety "Cypress" was planted in every other row as a border between experimental plots. Plots were arranged in a randomized complete block design with four replications, however only three of the replications were harvested. The field was fertilized with potassium (0-0-60) at a rate of 110 lbs/A before planting. A pre-emergence application of 1 pt/A Dual II Magnum + 0.75 oz/A Sandea for weed control as well as 49 lbs/A nitrogen in the form of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 49 lbs/A nitrogen in the form of 30% UAN was made. Additional hand weeding was done as necessary. Weed control in the trial was good. Phostrol was applied preventatively for downy mildew at a rate of 4 pts/A on August 18. No disease was observed in the plot but weather conditions were favorable for disease development in early and mid-August. No applications were made for insect control.

***Harvest:***

Harvest decisions were made based on visual evaluation of the individual plot. Plots were harvested to maximize the number of full (as opposed to dry or flat) pods. Not all replications for a variety were harvested on the same day. Harvest began on August 22 (85 DAP) and ended on September 12 (106 DAP).

A 10-foot section from each plot was harvested. The plants were cut off at soil level, counted and weighed. The plants were fed into a stationary FMC viner. Trash was removed from the shelled beans with a fan and a screen, and the cleaned beans were weighed to determine yield. A random sample of 100 succulent beans was weighed to determine 100 bean weight as a means of bean size comparison.

**Lines Evaluated in the Unirrigated Baby Lima Bean Trial Planted May 29, 2014**

| Line | Description |
|---|---|
| DE0407905 | UD irrigated selection |
| DE0505002A | UD irrigated selection |
| DE0801802B | UD irrigated selection |
| DE0802101A | UD irrigated selection |
| DE0802102A | UD irrigated selection |
| DE0802102B | UD irrigated selection |
| DE0802102C | UD irrigated selection |
| DE0802701B | UD irrigated selection |
| DE0900603A | UD irrigated selection |
| DE0900604A | UD irrigated selection |
| DE0900604B | UD irrigated selection |
| DE0900701D | UD irrigated selection |
| DE0900705C | UD dryland selection |
| DE0901201A | UD irrigated selection |
| DE0901201B | UD irrigated selection |
| DE0901204A | UD irrigated selection |
| DE0901204B | UD irrigated selection |
| DE0901502B | UD irrigated selection |
| DE0901601B | UD irrigated selection |
| DE0901902B | UD dryland selection |
| DE1000106C | UD dryland selection |
| DE1000106D | UD dryland selection |
| DE1000404A | UD dryland selection |
| DE1000503B | UD dryland selection |
| DE1000503C | UD dryland selection |
| DE1000603B | UD dryland selection |
| DE1000604A | UD dryland selection |
| DE1001501C | UD dryland selection |
| DE1001502A | UD dryland selection |
| DE1002002A | UD dryland selection |
| DE1002003A | UD dryland selection |
| C-elite Select | Standard variety |
| Cypress | Standard variety |

## Irrigated Baby Lima Bean Variety Trial at Georgetown, DE – Planted June 13, 2014

The Irrigated Baby Lima Bean Variety Trial was planted on June 13 and included a total of 57 lines. Eight of the lines were entered by the two participating seed companies: ADM Seedwest and Ben Fish & Son. Forty-five lines were from the University of Delaware lima bean breeding program. The remaining four lines were standard varieties planted as checks. The purpose of this trial is to evaluate new processing green baby lima bean varieties for yield, maturity, and quality under Delaware growing conditions.

**Entries in the Irrigated Baby Lima Bean Variety Trial Planted June 13, 2014**

| Variety Name | Source |
|---|---|
| G200381 | ADM |
| G200382 | ADM |
| G9002033 | ADM |
| G0026023 | ADM |
| G1054294 | ADM |
| Cypress | ADM (standard variety) |
| Meadow | ADM (standard variety) |
| GBL 24-04 | Ben Fish |
| GBL 26-04 | Ben Fish |
| GBL 21-04 | Ben Fish |
| GBL 184-85 | Ben Fish (standard variety) |
| C-elite Select | Ben Fish (standard variety) |
| DE0407905 | University of Delaware |
| DE0407907 | University of Delaware |
| DE0505002A | University of Delaware |
| DE0801802B | University of Delaware |
| DE0802101A | University of Delaware |
| DE0802102A | University of Delaware |
| DE0802102B | University of Delaware |
| DE0802102C | University of Delaware |
| DE0802701B | University of Delaware |
| DE0900603A | University of Delaware |
| DE0900604A | University of Delaware |
| DE0900604B | University of Delaware |
| DE0900701D | University of Delaware |
| DE0900705C | University of Delaware |
| DE0901201A | University of Delaware |
| DE0901201B | University of Delaware |
| DE0901204A | University of Delaware |
| DE0901204B | University of Delaware |
| DE0901502B | University of Delaware |
| DE0901601B | University of Delaware |
| DE0901902B | University of Delaware |
| DE1000701A | University of Delaware |
| DE1000701B | University of Delaware |
| DE1000802B | University of Delaware |
| DE1000802C | University of Delaware |
| DE1000901B | University of Delaware |
| DE1001101A | University of Delaware |
| DE1001102A | University of Delaware |
| DE1001102B | University of Delaware |
| DE1001102C | University of Delaware |
| DE1001102E | University of Delaware |
| DE1001104B | University of Delaware |
| DE1001201A | University of Delaware |
| DE1001201B | University of Delaware |
| DE1001201C | University of Delaware |
| DE1001202A | University of Delaware |
| DE1001202B | University of Delaware |
| DE1001202C | University of Delaware |
| DE1001202D | University of Delaware |
| DE1001202E | University of Delaware |
| DE1001701A | University of Delaware |
| DE1001802A | University of Delaware |
| DE1002303A | University of Delaware |
| DE1002303B | University of Delaware |
| DE1002502A | University of Delaware |

***Location:***

Field 25C/D at the University of Delaware Research and Education Center Farm, Georgetown, DE

***Cultural Practices:***
The trial was planted on June 13, 2014 with a Monosem planter. Some of the seed was treated, and some was not, as indicated in the results section. Varieties were planted in one-row plots with 30 inch between row spacing and 3 inch in-row spacing. Plots were 25 feet in length. The variety 'Cypress' was planted in every other row as a border between experimental plots. Plots were arranged in a randomized complete block design with four replications. The field was fertilized with potassium (0-0-60) at a rate of 110 lbs/A before planting. A pre-emergence application of 1 pt/A Dual II Magnum + 0.75 oz/A Sandea for weed control as well as 49 lbs/A nitrogen in the form of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 49 lbs/A nitrogen in the form of 30% UAN was made. Additional hand weeding was done as necessary. Weed control in the trial was good. Phostrol was applied preventatively for downy mildew at a rate of 4 pts/A on August 18. No disease was observed in the plot but weather conditions were favorable for disease development in early and mid August. No applications were made for insect control.

***Harvest:***
Harvest decisions were made based on visual evaluation of the individual plot. Plots were harvested to maximize the number of full (as opposed to dry or flat) pods. Not all replications for a variety were harvested on the same day. Harvest began on August 28 (76 DAP) and ended on September 17 (96 DAP).

A 15-foot section from each plot was harvested. The plants were cut off at soil level and weighed. To determine maturity at harvest, pods were stripped from five harvested plants from each plot and counted as full, flat or dry. The plants and pulled pods were fed into a stationary FMC viner. Trash was removed from the shelled beans with a fan and a screen, and the cleaned beans were weighed to determine yield. A random sample of 100 succulent beans was weighed to determine 100 bean weight as a means of bean size comparison.

***Quality Evaluation of Blanched and Frozen Samples of Baby Lima Lines:***
The processing quality of advanced UD breeding material was evaluated by six representatives of the regional processors at a meeting on December 16, 2014. Samples of 41 UD breeding lines, and the four standard cultivars in the trial (Meadow, Cypress, C-elite Select and GBL 184-85) were evaluated. Samples of harvested beans were washed and rotten, sprouted and split beans and plant debris were removed. Light colored beans were not graded out. The cleaned samples were blanched for three minutes in boiling water, and then cooled immediately in ice water. Cooled beans were drained using a salad spinner then packed in Ziploc plastic bags and frozen at -10°F. Four commercially frozen baby lima samples that were purchased at local grocery stores were included in the evaluation as controls. On the day of the evaluation the samples were thawed briefly in warm water, drained in a colander and a one cup sample was displayed in a white Styrofoam bowl. Samples were randomized and identified only by a number. The group of six evaluators was comprised of fieldmen, and processing and preprocessing quality experts from the four regional lima bean processors. Evaluators rated the samples for size, shape, color and overall acceptability. Photos of the samples are online at: http://extension.udel.edu/vegetableprogram/2015/02/06/2014-baby-lima-quality-evaluation/

## Results and Discussion of the Baby Lima Trials at Georgetown

### *Weather, Pod Set and Maturity for the Irrigated Baby Lima Trial*

Weather conditions in 2014 were wetter and cooler than the 2010-2012 seasons, which were the three warmest summers on record for Delaware, and similar to the 2013 season. As a result, we did not see the dramatic delay of maturity in the standard varieties that we saw in 2010 and 2011 in the irrigated baby lima trial. Maturity for Cypress and C-elite Select was slightly later than the historical average, but maturity for 184-85 was the same as the historical average. A comparison of days to harvest for the standard varieties versus the historical average is as follows:

| Variety | Days to Harvest in Irrigated Baby Lima Trials | | | | | |
|---|---|---|---|---|---|---|
| | Average 2006-2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| ***Planting Date*** | | ***June 6*** | ***June 6*** | ***June 14*** | ***June 13*** | ***June 13*** |
| Cypress | 77 | 91 | 97 | 82 | 77 | 82 |
| C-elite Select | 84 | 96 | 98 | 89 | 89 | 91 |
| 184-85 | 86 | 95 | 99 | 88 | 89 | 86 |

Split sets were not a problem in the irrigated trial baby lima trial this year.

### *Weather and Pod Set for the Dryland Baby Lima Trial*

The dryland baby lima trial was planted on May 29 and received 15.4 inches of rain during the growing season. Rainfall was timely and supported good plant growth. Cooler temperatures and adequate soil moisture during flowering allowed for concentrated set and higher than average yields for this trial.

### *Yield and Maturity in the May 29 Planted Dryland Baby Lima Trial*

The purpose of the May 29-planted, dryland baby lima trial was to evaluate some of the advanced breeding material from the University of Delaware that had been selected in dryland conditions. There were statistically significant differences in yield between some of the varieties in this trial (Table 1). Four varieties had significantly higher yields than C-elite Select in this trial, DE0505002A, DE0901601B, DE1000404A and DE0802101A, but none of the varieties had significantly higher yield than Cypress. None of the high yielding varieties in this year's trial were among the top varieties in the 2013 dryland trial but DE0505002A and DE0901601B were high yielding in 2013 compared to other varieties that matured at the same time. DE0802101A was the highest yielding variety that matured early in the 2014 dryland trial (Figure 1). DE0407905 has been tested in the irrigated variety trial for seven years (since 2008) and was included in the dryland in 2013 and 2014, because it is being considered for release. It performed well for its maturity class in the highly stressed 2013 trial and had an average yield in the 2014 dryland trial.

### *Yield and Maturity in the June 13 Planted Baby Lima Trial*

The purpose of the June 13-planted baby lima trial was to evaluate advanced breeding material from the University of Delaware, as well as new varieties available from the two companies supplying lima seed in Delaware under irrigated conditions. There were significant differences in yield between the varieties in this trial (Table 2). Yields were very high in this trail, due to favorable weather for pod set and pod fill. Thirty-eight of the fifty-seven varieties (67%) produced yields over 5000 lbs/A. In comparison, in 2013, seven out of fifty varieties (14% of

entries) produced yields over 5000 lbs/A. The highest yielding varieties in the 2014 trial were DE0900603A, DE0900604B, DE1001201A, DE1001102A, DE1001802A, DE0900604A, DE0901201A, DE1001104B, DE1001102B, and DE0900701D. Only DE0900603A had a significantly higher yield than C-elite Select, which produced 5835 lbs/A in this trial. Of the top yielding varieties, only DE1001104B and DE1001102B are green-seeded (Table 4 and Figure 2). Three varieties that matured extremely early in this trial, DE1000701B, DE0900705C, and DE1000701A, are also of interest. These varieties had lower yields compared to others in the trial but matured six days earlier than Cypress.

The performance of UD breeding lines with seed quality traits making them of particular interest for commercial release is as follows:

**DE0407905** matured in 88 days and yielded 5154 lbs/A. Yield in this trial was significantly higher than Meadow, but not significantly different than any of the other check varieties. In this trial as in past trials, DE0407905 was a few days earlier to mature than C-elite Select. This variety has been recommended for commercial release.

**DE0407907** matured in 88 days and yielded 5178 lbs/A. Yield in this trial was significantly higher than Meadow, but not significantly different than any of the other check varieties. In this trial, DE0407907 was a few days earlier to mature than C-elite Select, but historically the maturities of these two varieties has been the same. DE0407907 is resistant to race F of downy mildew. This variety has been recommended for commercial release.

**DE1001104B** matured in 92 days and yielded 6021 lbs/A. Yield was numerically higher but not significantly higher than C-elite Select in this trial, but it was significantly higher than GBL 184-85, Cypress and Meadow. This is the first year that DE1001104B has been evaluated in the trial and it will need to be evaluated in more stressful growing conditions before it is considered for release. Performance this year indicates that this variety has good quality traits, and is high yielding but late to mature.

**DE0901502B** matured in 90 days and yielded 5769 lbs/A. Yield was not significantly different than C-elite Select or 184-85 in this trial. Yield was significantly higher than Cypress and Meadow. DE0901502B was evaluated in the 2013 trial and yielded 4864 lbs/A and matured in 90 days. This variety will be evaluated in next year's trial to determine whether it offers a significant advantage over other varieties that mature at the same time.

**DE1001202C** matured in 86 days and yielded 5524 lbs/A. Yield was not significantly different than C-elite Select or 184-85 in this trial. Yield was significantly higher than Cypress and Meadow. DE1001202C was very similar in yield and maturity to DE0505002A, which is one of its parents and has been consistently high yielding in past trials. DE0505002A has green cotyledons but a light colored seed coat. DE1001202C has better seed quality characteristics than DE0505002. Additional testing will be needed to confirm its yield stability and maturity characteristics. DE10001202C is resistant to race F of downy mildew.

**DE1001202B** matured in 85 days and yielded 5407 lbs/A. Yield was not significantly different than C-elite Select or 184-85 in this trial. Yield was significantly higher than Cypress and Meadow. DE1001202B was very similar in yield and maturity to DE0505002A, which is one of its parents and has been consistently high yielding in past trials. DE0505002A has green cotyledons but a light colored seed coat. DE1001202C has better seed quality characteristics than DE0505002. Additional testing will be needed to confirm DE10001202B's yield stability and maturity characteristics.

**DE1000802B** matured in 84 days and yielded 5144 lbs/A. Yield was not significantly different than C-elite Select or 184-85 in this trial. Yield was significantly higher than Cypress and Meadow. DE1000802B has good seed quality characteristics and matured significantly earlier than C-elite Select and 184-85. DE1000802B is resistant to race F of downy mildew. This is the first year of yield testing for DE1000802B; it will be included in future trials to confirm its yield and maturity characteristics.

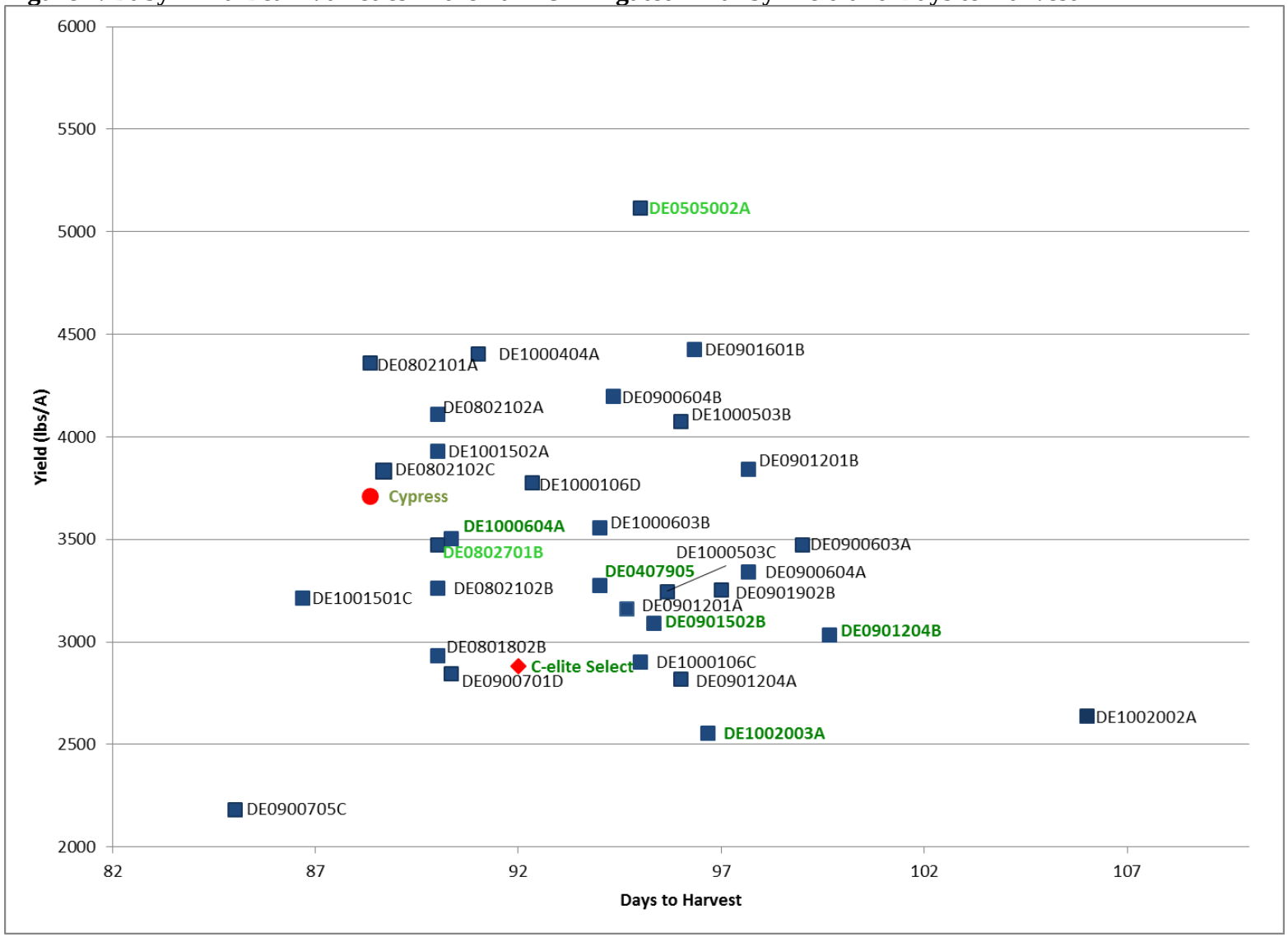
Among the varieties entered by ADM, none had yields that were significantly different than that of Cypress. G200381 and G200382 had numerically higher yields than Cypress and both of these varieties performed well in the 2011, 2012, and 2013 trials. Maturity for these two varieties was nearly identical to Cypress in this trial and also in most past trials.

Experimental varieties entered by Ben Fish were similar in yield and maturity to GBL 184-85. C-elite Select, was very high yielding in this trial and had significantly higher yield than GBL 184-85 and GBL24-04.

One characteristic desirable in a variety is uniform maturity across the field. The rate of maturity of some varieties is more affected by variations in field conditions (i.e. soil type, drainage, variable stand) than others. Standard deviation is a statistic used to describe the average difference between several individual observations and their mean (or average). The standard deviation of days to harvest for the replicated varieties in trial is given in Table 3. Varieties with the lowest standard deviation of days to harvest are those matured most uniformly across the field. The standard deviation of days to harvest was more variable this year than it was in 2012 or 2013. For varieties with higher standard deviation of days to harvest it may be more difficult to determine when to harvest the field for maximum yield and quality.

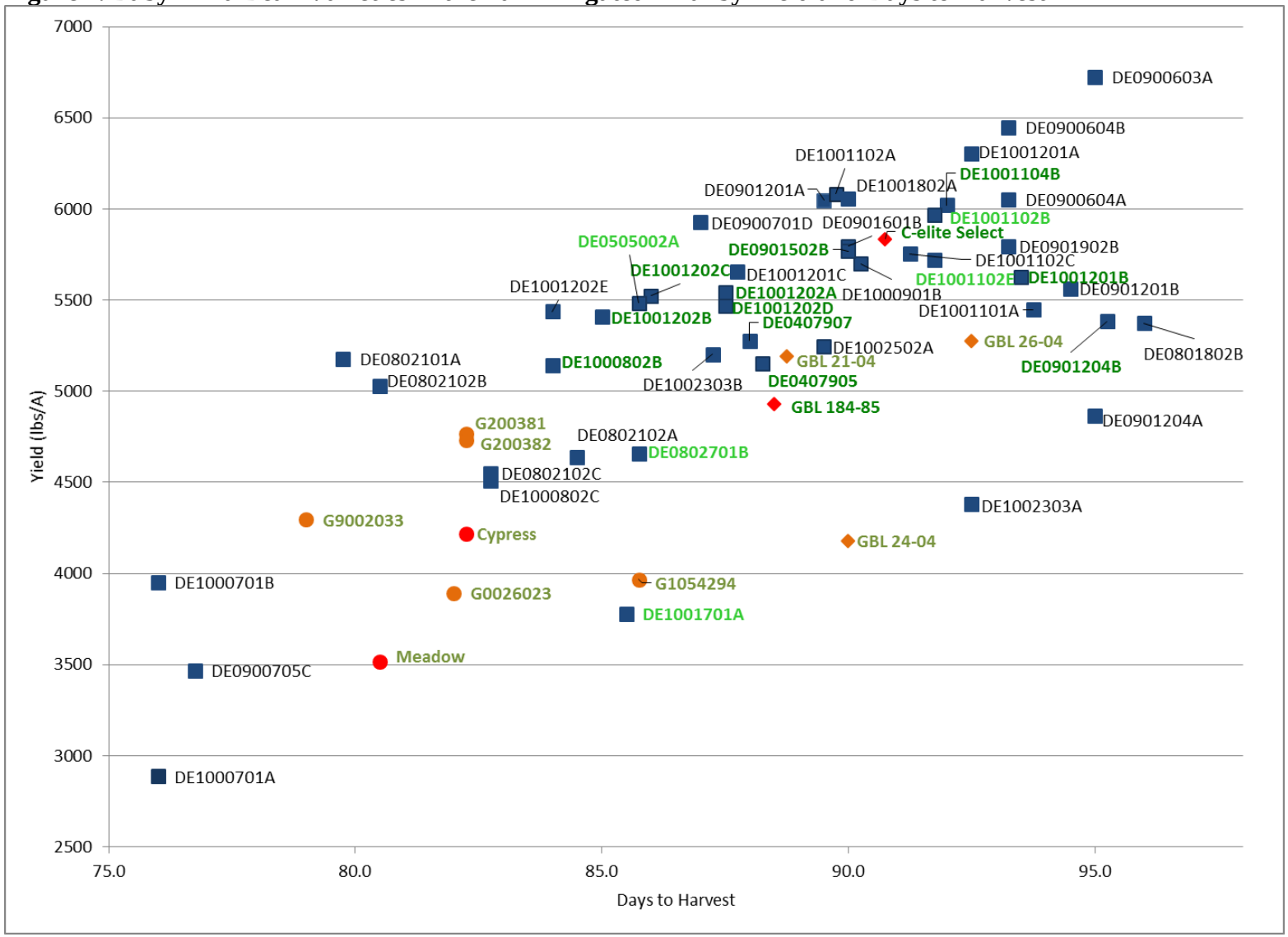
The breeding lines from the University of Delaware program that were evaluated in the trial are not all green seeded and exhibit a range of seed sizes. At harvest 100 succulent seeds from each plot were weighed as an indicator of seed size. The 100 seed weights, seedcoat color, cotyledon color, and yield for each variety in the trial are given in Table 4. Most of the lines in the trial did not have seed weights that were significantly different than C-elite Select (Figure 3), although some of the UD breeding lines were significantly larger than C-elite Select. DE1000802C had the largest seed and was rated as unacceptably large by one of six evaluators. DE1000701A had the smallest seed and was rated as unacceptably small by two out of six evaluators. For all of the lines that were evaluated for quality, the majority of evaluators fated the size as acceptable.

**Figure 1. Baby Lima Bean Varieties in the 2014 Unirrigated Trial by Yield and Days to Harvest***




* color of data label indicates seed color: **Green, rated acceptable by all evaluators**, **Green, rated acceptable by most evaluators**, **Green, but color not rated acceptable by most evaluators,** **Not Green**.

**Figure 2. Baby Lima Bean Varieties in the 2014 Irrigated Trial by Yield and Days to Harvest***




* color of data label indicates seed color: **Green, rated acceptable by all evaluators**, **Green, rated acceptable by most evaluators**, **Green, but color not rated acceptable by most evaluators or not evaluated,** **Not Green**.

**Figure 3. Baby Lima Bean Varieties in the 2014 Irrigated Trial by Weight of 100 Succulent Seeds**

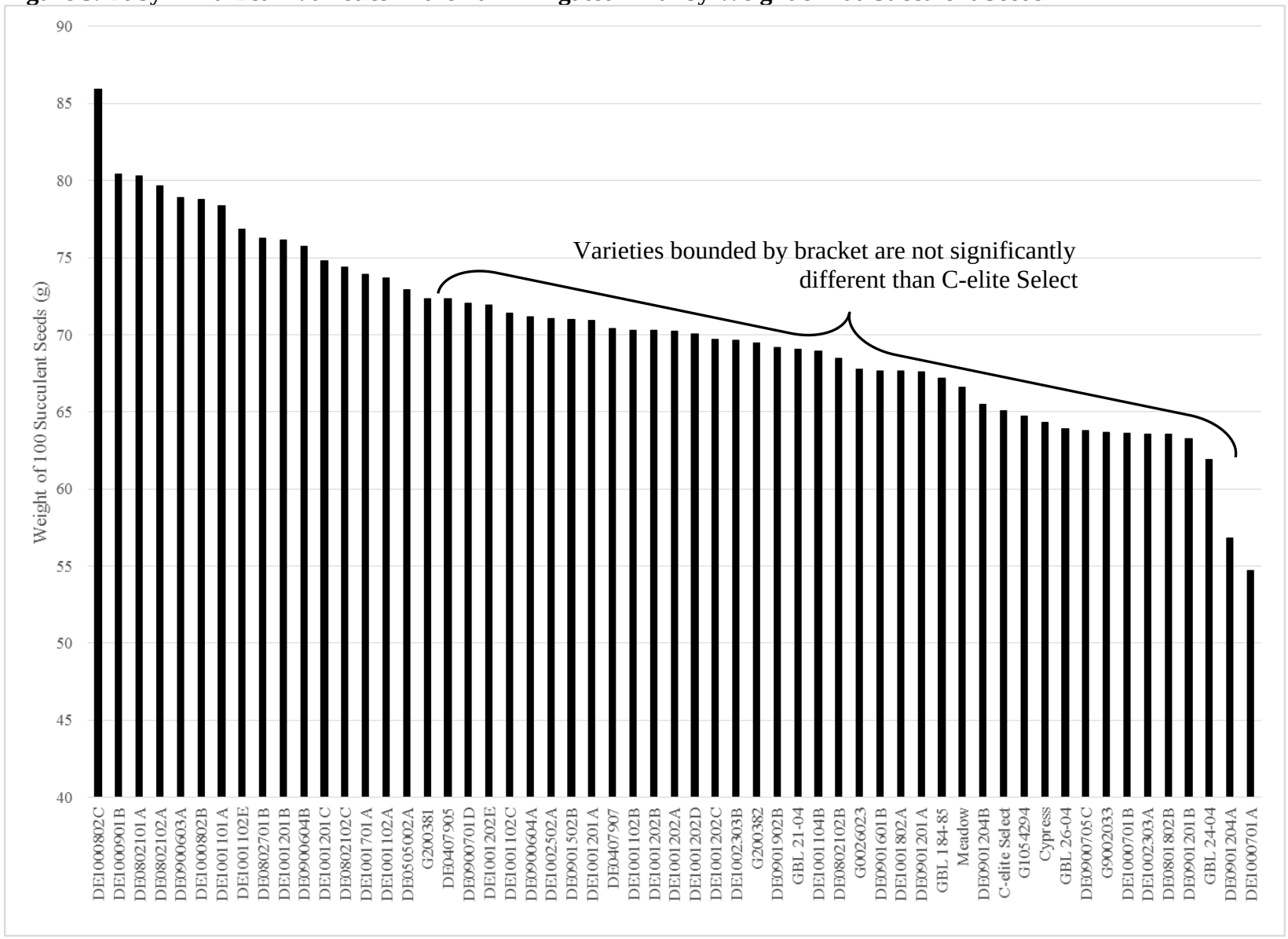


**Table 1. Days to Harvest, Yield, Plant Weight, and Percent Stand at Harvest for the Unirrigated Baby Lima Bean Variety Trial Planted May 29, 2014**

| Variety | Days to Harvest | Yield (Lbs/A) | Plant Weight (Lbs/10 ft) | % Stand[1] |
|---|---|---|---|---|
| DE0505002A | 95.0 b-g | 5119 a | 14.4 a-c | 90 a-d |
| DE0901601B | 96.3 b-d | 4428 ab | 11.9 b-f | 74 d-j |
| DE1000404A | 91.0 e-i | 4407 ab | 15.4 ab | 88 a-e |
| DE0802101A | 88.3 h-j | 4364 ab | 12.2 b-f | 99 a |
| DE0900604B | 94.3 c-g | 4197 a-c | 12.2 b-f | 74 d-j |
| DE0802102A | 90.0 g-j | 4110 a-c | 13.7 a-e | 82 b-g |
| DE1000503B | 96.0 b-e | 4077 a-c | 11.5 c-g | 83 a-g |
| DE1001502A | 90.0 g-j | 3933 a-d | 11.7 c-f | 61 ij |
| DE0901201B | 97.7 bc | 3844 a-d | 12.3 a-f | 88 a-f |
| DE0802102C | 88.7 h-j | 3834 a-d | 13.8 a-e | 79 c-g |
| DE1000106D | 92.3 d-h | 3777 a-d | 11.3 c-g | 72 f-j |
| Cypress | 88.3 h-j | 3713 a-d | 12.4 a-f | 81 b-g |
| DE1000603B | 94.0 c-g | 3560 b-e | 10.5 e-g | 59 j |
| DE1000604A | 90.3 f-i | 3503 b-e | 10.5 e-g | 73 e-j |
| DE0802701B | 90.0 g-j | 3475 b-e | 13.2 a-f | 84 a-g |
| DE0900603A | 99.0 bc | 3472 b-e | 11.0 c-g | 94 a-c |
| DE0900604A | 97.7 bc | 3342 b-e | 10.7 e-g | 85 a-f |
| DE0407905 | 94.0 c-g | 3275 b-e | 11.0 c-g | 68 g-j |
| DE0802102B | 90.0 g-j | 3265 b-e | 10.8 d-g | 86 a-f |
| DE0901902B | 97.0 b-d | 3253 b-e | 11.5 c-g | 97 ab |
| DE1000503C | 95.7 b-e | 3247 b-e | 11.7 c-f | 87 a-f |
| DE1001501C | 86.7 ij | 3216 b-e | 15.8 a | 93 a-c |
| DE0901201A | 94.7 b-g | 3163 b-e | 12.9 a-f | 76 d-i |
| DE0901502B | 95.3 b-f | 3093 b-e | 10.4 e-g | 78 c-h |
| DE0901204B | 99.7 b | 3032 b-e | 11.1 c-g | 62 ij |
| DE0801802B | 90.0 g-j | 2932 c-e | 13.0 a-f | 98 a |
| DE1000106C | 95.0 b-g | 2904 c-e | 11.2 c-g | 80 c-g |
| C-elite Select | 92.0 d-h | 2881 c-e | 9.8 fg | 73 e-j |
| DE0900701D | 90.3 f-i | 2848 c-e | 12.3 a-f | 88 a-e |
| DE0901204A | 96.0 b-e | 2820 c-e | 9.7 fg | 62 ij |
| DE1002002A | 106.0 a | 2638 de | 14.3 a-d | 87 a-f |
| DE1002003A | 96.7 b-d | 2558 de | 9.9 fg | 63 h-j |
| DE0900705C | 85.0 j | 2182 e | 8.0 g | 27 k |
| ***p-value*** | ***<0.0001*** | ***0.0544*** | ***0.0177*** | ***<0.0001*** |
| **Fisher's LSD[2]** | **5.0435** | **1416.6** | **3.5124** | **16.476** |
| **Tukey's HSD[3]** | **10.039** | **2819.7** | **6.9915** | **32.795** |

[1]Percent stand is highlighted for varieties for which treated seed was planted.
[2]Means followed by the same letter are not significantly different according to Fisher's LSD.
[3]Minimum significant difference according to Tukey's HSD.

**Table 2. Days to Harvest, Yield, Maturity at Harvest, Pods per Plant, Plant Weight, and Percent Stand for the Irrigated Baby Lima Bean Variety Trial Planted June 13, 2014**

| Variety | Days to Harvest | Yield (Lbs/A) | % Full Pods | % Flat Pods | % Dry Pods | # Pods/Plant | Plant Weight (Lbs/15 ft) | % Stand[1] |
|---|---|---|---|---|---|---|---|---|
| DE0900603A | 95.0 ab | 6726 a | 86.0 a | 0.7 l-n | 13.4 a | 26.8 b-g | 25.2 a-f | 90 e |
| DE0900604B | 93.3 a-f | 6448 ab | 62.0 a | 2.1 h-n | 35.9 a | 20.0 g-k | 23.5 c-j | 95 a |
| DE1001201A | 92.5 a-g | 6306 a-c | 78.6 a | 2.5 g-n | 19.0 a | 25.8 b-i | 26.4 a-d | 90 e |
| DE1001102A | 89.8 f-l | 6084 a-d | 84.3 a | 1.7 j-n | 14.0 a | 24.3 b-j | 25.2 a-f | 85 h |
| DE1001802A | 90.0 e-l | 6058 a-e | 78.7 a | 4.1 f-n | 17.2 a | 25.8 b-i | 25.0 a-g | 90 e |
| DE0900604A | 93.3 a-f | 6054 a-e | 78.3 a | 1.6 k-n | 20.1 a | 26.3 b-h | 23.5 c-j | 87 g |
| DE0901201A | 89.5 g-m | 6048 a-f | 79.8 a | 4.7 f-n | 15.6 a | 32.3 ab | 26.5 a-c | 88 f |
| DE1001104B | 92.0 b-h | 6021 a-g | 70.7 a | 0.2 n | 29.1 a | 23.3 c-j | 23.2 c-k | 81 i |
| DE1001102B | 91.8 b-i | 5967 a-h | 72.7 a | 2.0 i-n | 25.3 a | 23.3 c-j | 25.1 a-f | 92 c |
| DE0900701D | 87.0 l-q | 5927 a-h | 84.3 a | 7.5 d-m | 8.3 a | 30.0 a-c | 27.8 a | 86 h |
| C-elite Select | 90.8 d-k | 5835 b-i | 80.8 a | 4.0 f-n | 15.3 a | 29.0 a-e | 25.5 a-f | 89 f |
| DE0901902B | 93.3 a-f | 5797 b-j | 72.8 a | 1.8 i-n | 25.4 a | 22.5 c-k | 23.0 d-l | 90 e |
| DE0901601B | 90.0 e-l | 5795 b-j | 77.0 a | 3.5 f-n | 19.5 a | 22.8 c-j | 24.7 a-g | 89 f |
| DE1001102C | 91.3 c-j | 5790 b-j | 76.5 a | 3.2 g-n | 20.3 a | 25.5 b-i | 23.7 b-j | 86 h |
| DE0901502B | 90.0 e-l | 5769 b-j | 76.9 a | 3.4 f-n | 19.8 a | 22.3 c-k | 24.6 a-g | 87 g |
| DE1001102E | 91.8 b-i | 5722 b-k | 73.7 a | 0.8 l-n | 25.5 a | 26.5 b-h | 25.1 a-f | 89 f |
| DE1000901B | 90.3 d-l | 5700 b-k | 83.0 a | 3.5 f-n | 13.5 a | 23.3 c-j | 23.9 b-i | 89 f |
| DE1001201C | 87.8 j-p | 5656 b-k | 82.7 a | 3.0 g-n | 14.4 a | 24.3 b-j | 27.1 ab | 93 c |
| DE1001201B | 93.5 a-e | 5626 b-l | 77.0 a | 0.4 mn | 22.6 a | 19.3 g-k | 24.6 a-g | 87 g |
| DE0901201B | 94.5 a-c | 5564 c-m | 71.4 a | 0.4 n | 28.3 a | 25.0 b-i | 22.7 f-m | 90 d |
| DE1001202A | 87.5 k-q | 5543 c-m | 78.4 a | 3.6 f-n | 18.1 a | 23.0 c-j | 26.2 a-e | 85 h |
| DE1001202C | 86.0 m-r | 5524 c-n | 73.6 a | 5.8 e-n | 20.7 a | 21.3 e-k | 25.7 a-f | 88 f |
| DE0505002A | 85.8 n-s | 5484 c-o | 83.9 a | 5.7 e-n | 10.5 a | 25.5 b-i | 25.4 a-f | 90 e |
| DE1001101A | 93.8 a-d | 5447 c-o | 71.7 a | 0.4 n | 28.0 a | 17.8 i-k | 20.6 i-o | 85 h |
| DE1001202E | 84.0 q-u | 5437 c-o | 79.6 a | 4.0 f-n | 16.4 a | 24.8 b-i | 25.9 a-f | 89 f |
| DE1001202B | 85.0 o-t | 5407 d-p | 75.4 a | 3.7 f-n | 20.9 a | 22.8 c-j | 24.2 b-h | 91 c |
| DE1001202D | 87.5 k-q | 5391 d-p | 70.1 a | 1.1 k-n | 28.8 a | 20.8 f-k | 23.0 d-k | 85 h |
| DE0901204B | 95.3 ab | 5384 d-p | 73.3 a | 0.5 l-n | 26.2 a | 21.3 e-k | 24.6 a-g | 92 c |
| DE0801802B | 96.0 a | 5374 d-q | 76.5 a | 0.5 mn | 23.1 a | 21.8 d-k | 23.5 c-j | 94 b |
| GBL 26-04 | 92.5 a-g | 5276 d-q | 75.5 a | 0.5 l-n | 24.1 a | 25.0 b-i | 19.5 l-p | 73 i |
| DE1002502A | 89.5 g-m | 5245 d-r | 79.9 a | 8.8 d-j | 11.4 a | 29.8 a-d | 23.8 b-i | 84 h |
| DE1002303B | 87.3 k-q | 5204 e-r | 67.9 a | 12.0 c-e | 20.2 a | 25.8 b-i | 26.4 a-d | 93 c |
| GBL 21-04 | 88.8 h-n | 5190 e-r | 81.4 a | 7.2 e-n | 11.4 a | 24.5 b-j | 22.9 e-l | 77 i |
| DE0407907 | 88.0 j-p | 5178 f-r | 80.4 a | 3.9 f-n | 15.9 a | 27.0 b-g | 25.4 a-f | 78 i |
| DE0802101A | 79.8 v-x | 5177 g-r | 76.2 a | 17.3 bc | 6.6 a | 20.8 f-k | 22.6 f-n | 94 b |
| DE0407905 | 88.3 i-o | 5154 g-s | 75.1 a | 1.7 j-n | 23.2 a | 22.8 c-j | 24.1 b-i | 85 h |
| DE1000802B | 84.0 q-u | 5144 h-s | 74.5 a | 5.3 e-n | 20.3 a | 25.5 b-i | 23.1 c-k | 91 c |
| ***p-value*** | ***<0.0001*** | ***<0.0001*** | ***0.39*** | ***<0.0001*** | ***0.34*** | ***0.006*** | ***<0.0001*** | ***<0.0001*** |
| **Fisher's LSD[2]** | **3.6699** | **869.38** | **NA** | **7.13** | **NA** | **8.0907** | **3.448** | **9.324** |
| **Tukey's HSD[3]** | **7.6578** | **1814.1** | **NA** | **14.9** | **NA** | **16.883** | **7.1948** | **19.456** |

[1]Percent stand is highlighted for varieties for which treated seed was planted.
[2]Means followed by the same letter are not significantly different according to Fisher's LSD, star indicates that only two replications were planted and the variety was not included in statistical analysis.
[3]Minimum significant difference according to Tukey's HSD.

***Table 2 continues on the next page.***

**Table 2 (Continued). Days to Harvest, Yield, Maturity at Harvest, Pods per Plant, Plant Weight, and Percent Stand for the Irrigated Baby Lima Bean Variety Trial Planted June 13, 2013**

| Variety | Days to Harvest | Yield (Lbs/A) | % Full Pods | % Flat Pods | % Dry Pods | # Pods/Plant | Plant Weight (Lbs/15 ft) | % Stand[1] |
|---|---|---|---|---|---|---|---|---|
| DE0802102B | 80.5 u-w | 5030 i-t | 64.2 a | 2.1 h-n | 33.8 a | 20.0 g-k | 18.8 o-q | 87 g |
| GBL 184-85 | 88.5 h-o | 4929 j-t | 81.4 a | 4.6 f-n | 14.0 a | 26.5 b-h | 22.7 e-m | 85 h |
| DE0901204A | 95.0 ab | 4864 k-t | 66.8 a | 1.0 l-n | 32.2 a | 23.5 c-j | 23.3 c-j | 89 f |
| G200382 | 82.3 s-w | 4767 l-u | 66.0 a | 19.6 b | 14.4 a | 23.8 c-j | 22.9 e-l | 88 f |
| G200381 | 82.3 s-w | 4734 m-v | 68.6 a | 5.4 e-n | 26.1 a | 21.3 e-k | 20.8 h-o | 91 c |
| DE0802701B | 85.8 n-s | 4659 n-v | 70.4 a | 6.3 e-n | 23.4 a | 24.0 c-j | 24.0 b-i | 92 c |
| DE0802102A | 84.5 p-t | 4639 o-v | 69.1 a | 9.1 d-h | 21.8 a | 22.5 c-k | 22.9 e-l | 90 d |
| DE0802102C | 82.8 r-v | 4549 p-v | 68.9 a | 14.4 b-d | 16.7 a | 20.0 g-k | 21.6 g-o | 88 g |
| DE1000802C | 82.8 r-v | 4509 q-v | 69.8 a | 7.6 d-l | 22.6 a | 21.3 e-k | 19.7 k-p | 81 i |
| DE1002303A | 92.5 a-g | 4382 r-w | 62.9 a | 6.1 e-n | 31.1 a | 21.0 e-k | 22.6 f-n | 91 c |
| G9002033 | 79.0 w-y | 4295 s-x | 76.4 a | 8.9 d-i | 14.7 a | 19.3 g-k | 20.2 j-p | 89 f |
| Cypress | 82.3 s-w | 4221 t-x | 72.3 a | 5.9 e-n | 21.8 a | 23.3 c-j | 19.2 n-q | 83 h |
| GBL 24-04 | 90.0 e-l | 4178 t-x | 82.4 a | 4.8 f-n | 12.9 a | 36.3 a | 18.5 o-q | 46 k |
| G1054294 | 85.8 n-s | 3968 u-x | 78.3 a | 10.4 c-f | 11.4 a | 28.3 a-f | 19.3 m-p | 63 j |
| G0026023 | 82.0 t-w | 3894 v-x | 80.7 a | 4.7 f-n | 14.7 a | 22.0 c-k | 18.3 o-q | 86 h |
| DE1000701B | 76.0 * | 3685 * | 80.1 * | 2.0 * | 17.9 * | 24.0 * | 19.0 * | 87 * |
| Meadow | 80.5 u-w | 3516 w-y | 65.8 a | 9.3 d-g | 25.0 a | 18.5 h-k | 17.2 pq | 80 i |
| DE1001701A | 85.5 * | 3514 * | 83.1 * | 10.1 * | 6.8 * | 27.2 * | 25.0 * | 73 * |
| DE0900705C | 76.8 xy | 3469 xy | 63.5 a | 31.1 a | 5.4 a | 16.5 jk | 23.8 b-i | 87 g |
| DE1000701A | 76.0 y | 2887 y | 59.0 a | 8.1 d-k | 32.9 a | 14.5 k | 15.8 q | 92 c |
| ***p-value*** | ***<0.0001*** | ***<0.0001*** | ***0.39*** | ***<0.0001*** | ***0.34*** | ***0.006*** | ***<0.0001*** | ***<0.0001*** |
| **Fisher's LSD[2]** | **3.6699** | **869.38** | **NA** | **7.13** | **NA** | **8.0907** | **3.448** | **9.324** |
| **Tukey's HSD[3]** | **7.6578** | **1814.1** | **NA** | **14.9** | **NA** | **16.883** | **7.1948** | **19.456** |

[1]Percent stand is highlighted for varieties for which treated seed was planted.
[2]Means followed by the same letter are not significantly different according to Fisher's LSD, star indicates that only two replications were planted and the variety was not included in statistical analysis.
[3]Minimum significant difference according to Tukey's HSD.

**Table 3. Average Days to Harvest and Standard Deviation of Days to Harvest for the Irrigated Baby Lima Bean Variety Trial Planted June 13, 2014**

| Variety | Average Days to Harvest | Standard Deviation of Days to Harvest* |
|---|---|---|
| G0026023 | 82.0 | 0.00 |
| DE0900701D | 87.0 | 0.00 |
| DE0801802B | 96.0 | 0.00 |
| DE1000701A | 76.0 | 0.00 |
| GBL 21-04 | 88.8 | 0.50 |
| G200381 | 82.3 | 0.50 |
| G200382 | 82.3 | 0.50 |
| Cypress | 82.3 | 0.50 |
| DE0900705C | 76.8 | 0.50 |
| DE0802102C | 82.8 | 0.50 |
| DE1000802C | 82.8 | 0.50 |
| GBL 184-85 | 88.5 | 0.58 |
| DE1001202A | 87.5 | 0.58 |
| DE0901204B | 95.3 | 0.96 |
| DE1001201C | 87.8 | 0.96 |
| DE0901201B | 94.5 | 1.00 |
| DE1001202D | 87.5 | 1.00 |
| DE0900603A | 95.0 | 1.15 |
| DE0901204A | 95.0 | 1.15 |
| DE0900604A | 93.3 | 1.50 |
| DE0901902B | 93.3 | 1.50 |
| DE1000802B | 84.0 | 2.00 |
| DE1001202C | 86.0 | 2.00 |
| DE1001202E | 84.0 | 2.00 |
| DE1001202B | 85.0 | 2.31 |
| C-elite Select | 90.8 | 2.36 |
| DE1001104B | 92.0 | 2.45 |
| G1054294 | 85.8 | 2.50 |
| DE0802701B | 85.8 | 2.50 |
| DE1000901B | 90.3 | 2.50 |
| GBL 24-04 | 90.0 | 2.71 |
| DE1001102A | 89.8 | 2.87 |
| DE0802102A | 84.5 | 2.89 |
| DE0900604B | 93.3 | 2.99 |
| Meadow | 80.5 | 3.00 |
| DE0802102B | 80.5 | 3.00 |
| DE0901201A | 89.5 | 3.11 |
| DE1002502A | 89.5 | 3.11 |
| DE0802101A | 79.8 | 3.20 |
| DE0505002A | 85.8 | 3.20 |
| DE1001102C | 91.3 | 3.20 |
| DE1001101A | 93.8 | 3.30 |
| G9002033 | 79.0 | 3.46 |
| DE1001201B | 93.5 | 3.79 |
| DE1001102B | 91.8 | 3.86 |
| DE1001102E | 91.8 | 3.86 |
| GBL 26-04 | 92.5 | 4.04 |
| DE1002303A | 92.5 | 4.04 |
| DE0901502B | 90.0 | 4.08 |
| DE0901601B | 90.0 | 4.08 |
| DE1001802A | 90.0 | 4.08 |
| DE1001201A | 92.5 | 4.36 |
| DE0407907 | 88.0 | 4.55 |
| DE0407905 | 88.3 | 4.57 |
| DE1002303B | 87.3 | 6.13 |

**Standard Deviation of Days to Harvest**
Standard deviation of days to harvest describes the average number of days between harvest of an individual plot of a variety and the overall average days to harvest for all of the plots of that variety. Varieties with low standard deviation of days to harvest, reached maturity at the same time. Varieties with high standard deviation of days to harvest did not mature uniformly.

**Table 4. Yield, 100 Seed Weight, Seedcoat Color, Overall Quality Rating and Quality Defects for Varieties in the 2014 Irrigated Baby Lima Trial**

| Variety | Yield (lbs/A) | Weight of 100 Succulent Seeds (g) | Seedcoat Color | 100% of Evaluators Rating Overall Acceptable | Defects Noted by Evaluators |
|---|---|---|---|---|---|
| DE0900603A | 6726 a | 78.90 a-d | pink/red speckle | not rated | |
| DE0900604B | 6448 ab | 75.75 b-h | buff/black speckle | not rated | |
| DE1001201A | 6306 a-c | 70.96 f-p | light green | 67 | color, too big |
| DE1001102A | 6084 a-d | 73.70 b-k | light green | 50 | color, too big |
| DE1001802A | 6058 a-e | 67.63 i-r | light green | 50 | color |
| DE0900604A | 6054 a-e | 71.19 e-o | pink/red speckle | not rated | |
| DE0901201A | 6048 a-f | 67.58 i-r | light green | 17 | color, too small |
| DE1001104B | 6021 a-g | 68.93 h-r | green | 100 | |
| DE1001102B | 5967 a-h | 70.28 f-q | light green | 83 | color |
| DE0900701D | 5927 a-h | 72.05 d-m | light green | 50 | color, too small |
| C-elite Select | 5835 b-i | 65.05 m-r | green | 100 | |
| DE0901902B | 5797 b-j | 69.19 g-q | light green | not rated | |
| DE0901601B | 5795 b-j | 67.67 i-r | light green | not rated | |
| DE1001102C | 5790 b-j | 71.37 e-o | light green | 50 | color |
| DE0901502B | 5769 b-j | 70.98 f-p | green | 100 | |
| DE1001102E | 5722 b-k | 76.87 b-f | light green | 83 | color |
| DE1000901B | 5700 b-k | 80.40 ab | greenish buff with hilum ring | not rated | |
| DE1001201C | 5656 b-k | 74.79 b-i | light green | 67 | color, variable size |
| DE1001201B | 5626 b-l | 76.16 b-h | green | 100 | |
| DE0901201B | 5564 c-m | 63.24 q-s | white | 0 | color |
| DE1001202A | 5543 c-m | 70.23 f-q | green | 100 | |
| DE1001202C | 5524 c-n | 69.69 f-q | green | 100 | |
| DE0505002A | 5484 c-o | 72.95 c-k | light green | 100 | color |
| DE1001101A | 5447 c-o | 78.35 b-e | light green | not rated | |
| DE1001202E | 5437 c-o | 71.94 d-n | light green | 50 | color |
| DE1001202B | 5407 d-p | 70.27 f-q | green | 100 | |
| DE1001202D | 5391 d-p | 70.08 f-q | green | 100 | |
| DE0901204B | 5384 d-p | 65.50 l-r | green | 100 | |
| DE0801802B | 5374 d-q | 63.53 q-s | white | 17 | color |
| GBL 26-04 | 5276 d-q | 63.92 p-s | green | not rated | |
| DE1002502A | 5245 d-r | 71.06 f-p | light green | 67 | color |
| DE1002303B | 5204 e-r | 69.67 f-q | buff/black speckle | 17 | color, shape, too big |
| GBL 21-04 | 5190 e-r | 69.08 g-r | green | not rated | |
| DE0407907 | 5178 f-r | 70.40 f-q | green | 100 | |
| DE0802101A | 5177 g-r | 80.31 ab | buff/magenta speckle | 17 | color, shape, too big |
| DE0407905 | 5154 g-s | 72.31 d-m | green | 100 | |
| DE1000802B | 5144 h-s | 78.79 a-d | lt green | 100 | |
| ***p-value*** | ***<0.0001*** | ***<0.0001*** | | | |
| **Fishers' LSD[1]** | **869.38** | **7.2722** | | | |
| **Tukey's HSD[2]** | **1814.1** | **15.175** | | | |

***Table 4 continued on the next page***

**Table 4. Yield, 100 Seed Weight, Seedcoat Color, Overall Quality Rating and Quality Defects for Varieties in the 2014 Irrigated Baby Lima Trial *continued***

| Variety | Yield (lbs/A) | Weight of 100 Succulent Seeds (g) | Seedcoat Color | 100% of Evaluators Rating Overall Acceptable | Defects Noted by Evaluators |
|---|---|---|---|---|---|
| DE0802102B | 5030 i-t | 68.45 i-r | light green | 33 | color, shape |
| GBL 184-85 | 4929 j-t | 67.19 j-r | green | 100 | |
| DE0901204A | 4864 k-t | 56.82 st | light green | 33 | color |
| G200382 | 4767 l-u | 69.46 g-q | green | not rated | |
| G200381 | 4734 m-v | 72.34 d-l | green | not rated | |
| DE0802701B | 4659 n-v | 76.25 b-g | light green | 100 | color |
| DE0802102A | 4639 o-v | 79.65 a-c | light green | 33 | color, shape, too small |
| DE0802102C | 4549 p-v | 74.40 b-j | white | 17 | color |
| DE1000802C | 4509 q-v | 85.90 a | light green | 50 | color, too big |
| DE1002303A | 4382 r-w | 63.54 q-s | buff/black speckle | not rated | |
| G9002033 | 4295 s-x | 63.68 q-s | green | not rated | |
| Cypress | 4221 t-x | 64.29 o-r | green | 33 | color |
| GBL 24-04 | 4178 t-x | 61.89 r-t | green | not rated | |
| G1054294 | 3968 u-x | 64.74 n-r | green | not rated | |
| G0026023 | 3894 v-x | 67.79 i-r | green | not rated | |
| DE1000701B | 3685 * | 63.60 * | light green | not rated | |
| Meadow | 3516 w-y | 66.57 k-r | green | 50 | color |
| DE1001701A | 3514 * | 73.90 * | green | 83 | color, too small |
| DE0900705C | 3469 xy | 63.81 p-s | light green | 33 | color |
| DE1000701A | 2887 y | 54.73 t | light green | 33 | color, too small, |
| ***p-value*** | ***<0.0001*** | ***<0.0001*** | | | |
| **Fishers' LSD[1]** | **869.38** | **7.2722** | | | |
| **Tukey's HSD[2]** | **1814.1** | **15.175** | | | |

[1]Means followed by the same letter are not significantly different according to Fisher's LSD.
[2]Minimum significant difference according to Tukey's HSD.

**Table 5. Processor Evaluator Ratings of Blanched and Frozen Samples of Succulent Baby Limas from the Georgetown Variety Trials**

| Variety | Percent of Evaluators Rating as Acceptable | | | |
|---|---|---|---|---|
| | Color | Shape | Size | Overall |
| DE1001104B | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1001202B | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1000802B | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1001202A | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0901204B | 100.0 | 100.0 | 100.0 | 100.0 |
| C-elite Select | 100.0 | 100.0 | 100.0 | 100.0 |
| GBL 184-85 | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1001202C | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0901502B | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1001202D | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0407907 | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0407905 | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1001201B | 100.0 | 100.0 | 83.3 | 100.0 |
| DE1002003A | 100.0 | 100.0 | 83.3 | 100.0 |
| DE0505002A | 83.3 | 100.0 | 100.0 | 100.0 |
| DE0802701B | 83.3 | 100.0 | 100.0 | 100.0 |
| DE1000604A | 100.0 | 83.3 | 83.3 | 100.0 |
| Commercial Sample A* | 83.3 | 100.0 | 83.3 | 100.0 |
| DE1001102B | 83.3 | 100.0 | 100.0 | 83.3 |
| DE1001102E | 83.3 | 100.0 | 100.0 | 83.3 |
| DE1001701A | 83.3 | 100.0 | 83.3 | 83.3 |
| DE1002502A | 66.7 | 100.0 | 100.0 | 66.7 |
| DE1001201A | 66.7 | 100.0 | 83.3 | 66.7 |
| DE1001201C | 66.7 | 83.3 | 66.7 | 66.7 |
| Meadow | 50.0 | 100.0 | 100.0 | 50.0 |
| DE1001802A | 50.0 | 100.0 | 100.0 | 50.0 |
| DE1001202E | 16.7 | 100.0 | 100.0 | 50.0 |
| DE1000603B | 66.7 | 100.0 | 83.3 | 50.0 |
| DE1000802C | 33.3 | 100.0 | 83.3 | 50.0 |
| DE1001102A | 50.0 | 83.3 | 66.7 | 50.0 |
| DE0900701D | 50.0 | 100.0 | 83.3 | 50.0 |
| DE1001102C | 50.0 | 83.3 | 100.0 | 50.0 |
| DE0802102B | 50.0 | 83.3 | 100.0 | 33.3 |
| DE0900705C | 33.3 | 100.0 | 100.0 | 33.3 |
| Cypress | 33.3 | 100.0 | 100.0 | 33.3 |
| DE0901204A | 16.7 | 100.0 | 100.0 | 33.3 |
| DE1000503B | 33.3 | 83.3 | 100.0 | 33.3 |
| DE1000701A | 33.3 | 100.0 | 66.7 | 33.3 |
| DE0802102A | 33.3 | 83.3 | 66.7 | 33.3 |
| Commercial Sample B* | 33.3 | 66.7 | 83.3 | 33.3 |
| Commercial Sample C* | 16.7 | 100.0 | 100.0 | 16.7 |
| DE0802102C | 16.7 | 100.0 | 100.0 | 16.7 |
| DE0801802B | 0.0 | 100.0 | 100.0 | 16.7 |
| Commercial Sample D* | 16.7 | 83.3 | 83.3 | 16.7 |
| DE1000503C | 16.7 | 83.3 | 83.3 | 16.7 |
| DE0901201A | 16.7 | 83.3 | 83.3 | 16.7 |
| DE0802101A | 16.7 | 66.7 | 83.3 | 16.7 |
| DE1002303B | 16.7 | 66.7 | 66.7 | 16.7 |
| DE0901201B | 0.0 | 83.3 | 83.3 | 0.0 |

*****Commercially frozen green baby lima beans purchased at local grocery stores

**Appendix A: Weather Data for 2014 Baby Lima Variety Trials at Georgetown**
**May 29th (first planting) to September 17th (final harvest)**

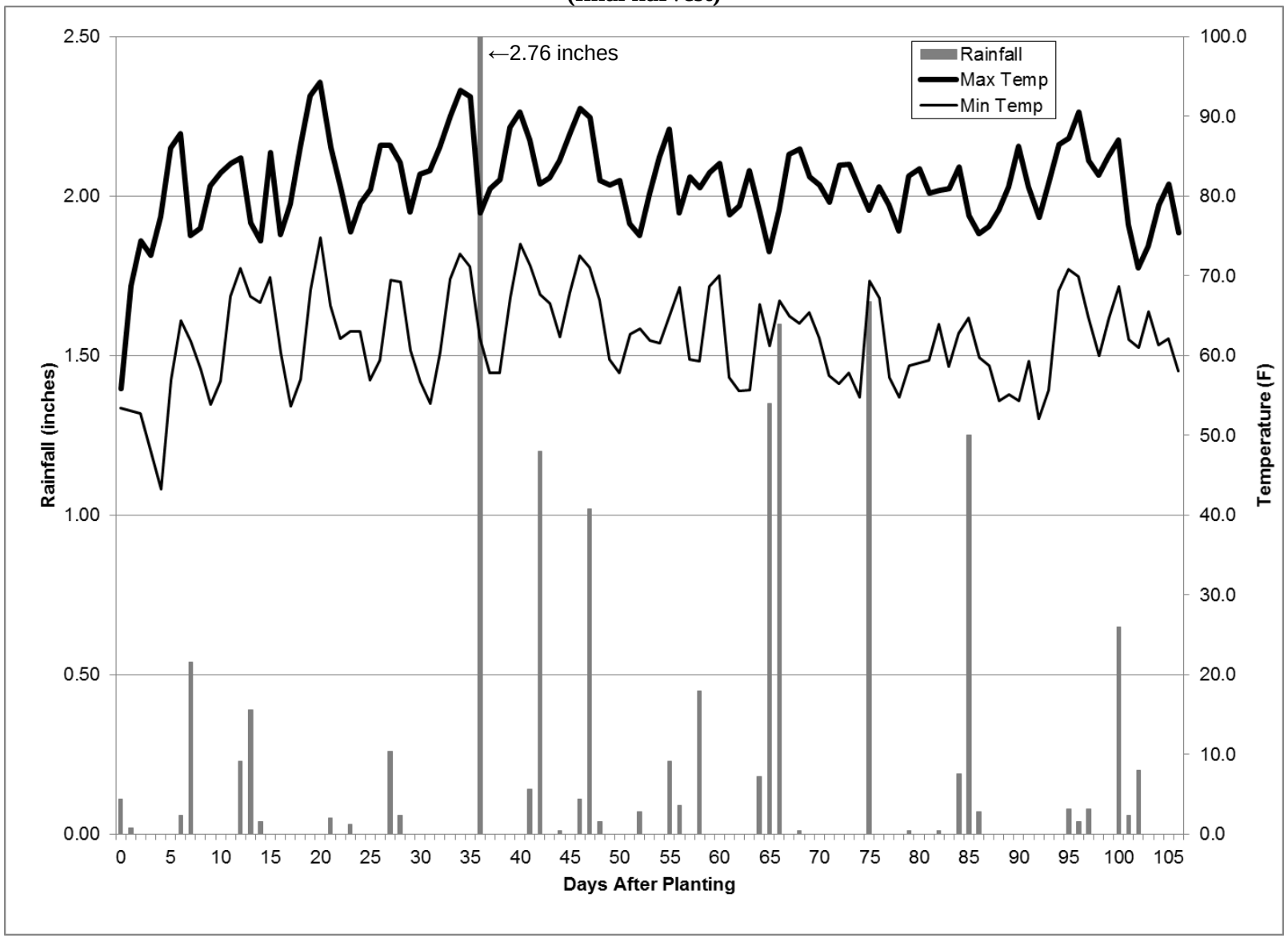
*Data from DEOS weather station @ Georgetown, DE-REC: www.deos.udel.edu*

| Days After Planting | | Date | Max Temp °F | Min Temp °F | Rainfall (in.) |
|---|---|---|---|---|---|
| May 29 Dryland Trial | June 13 Irrigated Trial | | | | |
| 0 | | 29-May | 55.9 | 53.4 | 0.11 |
| 1 | | 30-May | 68.7 | 53.1 | 0.02 |
| 2 | | 31-May | 74.4 | 52.8 | 0 |
| 3 | | 1-Jun | 72.6 | 48.2 | 0 |
| 4 | | 2-Jun | 77.5 | 43.3 | 0 |
| 5 | | 3-Jun | 86.1 | 57.0 | 0 |
| 6 | | 4-Jun | 87.9 | 64.4 | 0.06 |
| 7 | | 5-Jun | 75.1 | 61.8 | 0.54 |
| 8 | | 6-Jun | 76.0 | 58.3 | 0 |
| 9 | | 7-Jun | 81.3 | 53.9 | 0 |
| 10 | | 8-Jun | 83.0 | 56.8 | 0 |
| 11 | | 9-Jun | 84.1 | 67.4 | 0 |
| 12 | | 10-Jun | 84.8 | 71.0 | 0.23 |
| 13 | | 11-Jun | 76.7 | 67.4 | 0.39 |
| 14 | | 12-Jun | 74.4 | 66.7 | 0.04 |
| 15 | 0 | 13-Jun | 85.5 | 69.8 | 0 |
| 16 | 1 | 14-Jun | 75.2 | 60.3 | 0 |
| 17 | 2 | 15-Jun | 79.0 | 53.7 | 0 |
| 18 | 3 | 16-Jun | 86.2 | 57.1 | 0 |
| 19 | 4 | 17-Jun | 92.6 | 68.3 | 0 |
| 20 | 5 | 18-Jun | 94.3 | 74.8 | 0 |
| 21 | 6 | 19-Jun | 86.2 | 66.3 | 0.05 |
| 22 | 7 | 20-Jun | 81.1 | 62.1 | 0 |
| 23 | 8 | 21-Jun | 75.5 | 63.1 | 0.03 |
| 24 | 9 | 22-Jun | 79.1 | 63.1 | 0 |
| 25 | 10 | 23-Jun | 80.9 | 56.9 | 0 |
| 26 | 11 | 24-Jun | 86.4 | 59.4 | 0 |
| 27 | 12 | 25-Jun | 86.4 | 69.5 | 0.26 |
| 28 | 13 | 26-Jun | 84.2 | 69.3 | 0.06 |
| 29 | 14 | 27-Jun | 78.0 | 60.7 | 0 |
| 30 | 15 | 28-Jun | 82.8 | 56.7 | 0 |
| 31 | 16 | 29-Jun | 83.2 | 54.0 | 0 |
| 32 | 17 | 30-Jun | 86.2 | 60.5 | 0 |
| 33 | 18 | 1-Jul | 90.1 | 69.6 | 0 |
| 34 | 19 | 2-Jul | 93.3 | 72.8 | 0 |
| 35 | 20 | 3-Jul | 92.5 | 71.2 | 0 |
| 36 | 21 | 4-Jul | 77.9 | 62.3 | 2.76 |
| 37 | 22 | 5-Jul | 81.0 | 57.9 | 0 |
| 38 | 23 | 6-Jul | 82.1 | 57.9 | 0 |
| 39 | 24 | 7-Jul | 88.6 | 67.3 | 0 |
| 40 | 25 | 8-Jul | 90.6 | 74.0 | 0 |
| 41 | 26 | 9-Jul | 87.1 | 71.3 | 0.14 |
| 42 | 27 | 10-Jul | 81.5 | 67.7 | 1.2 |
| 43 | 28 | 11-Jul | 82.3 | 66.6 | 0 |
| 44 | 29 | 12-Jul | 84.5 | 62.4 | 0.01 |
| 45 | 30 | 13-Jul | 88.0 | 67.9 | 0 |
| 46 | 31 | 14-Jul | 91.0 | 72.5 | 0.11 |
| 47 | 32 | 15-Jul | 89.9 | 71.1 | 1.02 |
| 48 | 33 | 16-Jul | 82.0 | 67.0 | 0.04 |
| 49 | 34 | 17-Jul | 81.4 | 59.6 | 0 |

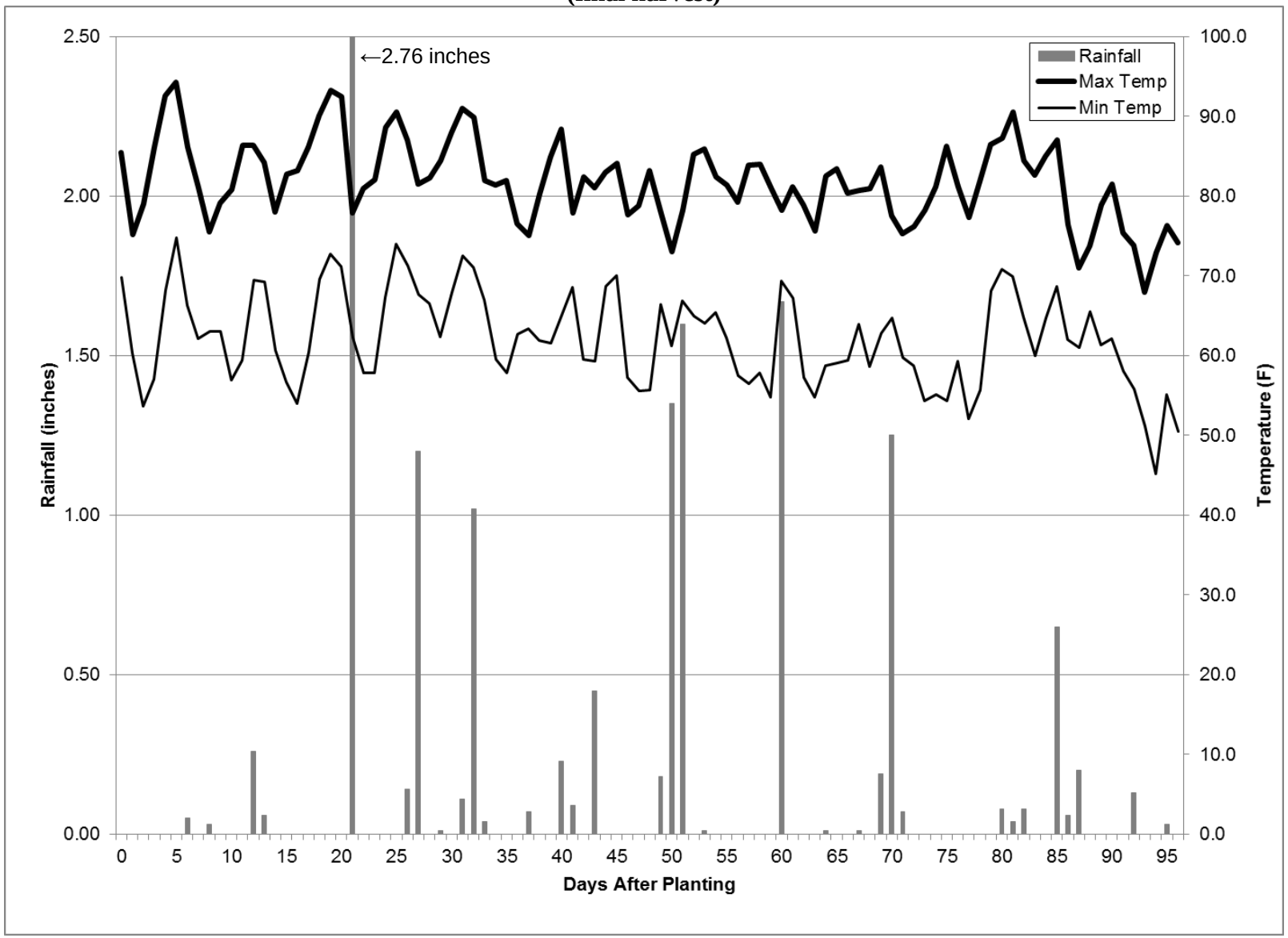
| Days After Planting | | Date | Max Temp °F | Min Temp °F | Rainfall (in.) |
|---|---|---|---|---|---|
| May 29 Dryland Trial | June 13 Irrigated Trial | | | | |
| **50** | **35** | **18-Jul** | 82.0 | 57.9 | 0 |
| **51** | **36** | **19-Jul** | 76.5 | 62.7 | 0 |
| **52** | **37** | **20-Jul** | 75.1 | 63.4 | 0.07 |
| **53** | **38** | **21-Jul** | 80.3 | 61.9 | 0 |
| **54** | **39** | **22-Jul** | 84.9 | 61.6 | 0 |
| **55** | **40** | **23-Jul** | 88.4 | 65.1 | 0.23 |
| **56** | **41** | **24-Jul** | 77.9 | 68.6 | 0.09 |
| **57** | **42** | **25-Jul** | 82.4 | 59.5 | 0 |
| **58** | **43** | **26-Jul** | 81.1 | 59.3 | 0.45 |
| **59** | **44** | **27-Jul** | 83.0 | 68.7 | 0 |
| **60** | **45** | **28-Jul** | 84.1 | 70.0 | 0 |
| **61** | **46** | **29-Jul** | 77.7 | 57.3 | 0 |
| **62** | **47** | **30-Jul** | 78.8 | 55.6 | 0 |
| **63** | **48** | **31-Jul** | 83.2 | 55.7 | 0 |
| **64** | **49** | **1-Aug** | 78.2 | 66.4 | 0.18 |
| **65** | **50** | **2-Aug** | 73.1 | 61.2 | 1.35 |
| **66** | **51** | **3-Aug** | 78.2 | 66.9 | 1.6 |
| **67** | **52** | **4-Aug** | 85.3 | 65.0 | 0 |
| **68** | **53** | **5-Aug** | 85.9 | 64.1 | 0.01 |
| **69** | **54** | **6-Aug** | 82.4 | 65.4 | 0 |
| **70** | **55** | **7-Aug** | 81.4 | 62.3 | 0 |
| **71** | **56** | **8-Aug** | 79.3 | 57.5 | 0 |
| **72** | **57** | **9-Aug** | 83.9 | 56.5 | 0 |
| **73** | **58** | **10-Aug** | 84.0 | 57.9 | 0 |
| **74** | **59** | **11-Aug** | 81.1 | 54.8 | 0 |
| **75** | **60** | **12-Aug** | 78.2 | 69.4 | 1.67 |
| **76** | **61** | **13-Aug** | 81.2 | 67.2 | 0 |
| **77** | **62** | **14-Aug** | 78.9 | 57.3 | 0 |
| **78** | **63** | **15-Aug** | 75.6 | 54.8 | 0 |
| **79** | **64** | **16-Aug** | 82.5 | 58.7 | 0.01 |
| **80** | **65** | **17-Aug** | 83.5 | 59.1 | 0 |
| **81** | **66** | **18-Aug** | 80.4 | 59.4 | 0 |
| **82** | **67** | **19-Aug** | 80.7 | 63.9 | 0.01 |
| **83** | **68** | **20-Aug** | 81.0 | 58.6 | 0 |
| **84** | **69** | **21-Aug** | 83.7 | 62.8 | 0.19 |
| **85** | **70** | **22-Aug** | 77.6 | 64.7 | 1.25 |
| **86** | **71** | **23-Aug** | 75.3 | 59.8 | 0.07 |
| **87** | **72** | **24-Aug** | 76.2 | 58.7 | 0 |
| **88** | **73** | **25-Aug** | 78.2 | 54.4 | 0 |
| **89** | **74** | **26-Aug** | 81.2 | 55.1 | 0 |
| **90** | **75** | **27-Aug** | 86.3 | 54.3 | 0 |
| **91** | **76** | **28-Aug** | 81.2 | 59.3 | 0 |
| **92** | **77** | **29-Aug** | 77.3 | 52.1 | 0 |
| **93** | **78** | **30-Aug** | 81.9 | 55.7 | 0 |
| **94** | **79** | **31-Aug** | 86.5 | 68.1 | 0 |
| **95** | **80** | **1-Sep** | 87.3 | 70.8 | 0.08 |
| **96** | **81** | **2-Sep** | 90.6 | 69.9 | 0.04 |
| **97** | **82** | **3-Sep** | 84.5 | 64.8 | 0.08 |
| **98** | **83** | **4-Sep** | 82.6 | 60.0 | 0 |
| **99** | **84** | **5-Sep** | 85.0 | 64.7 | 0 |
| **100** | **85** | **6-Sep** | 87.1 | 68.7 | 0.65 |
| **101** | **86** | **7-Sep** | 76.4 | 62.0 | 0.06 |

| Days After Planting | | Date | Max Temp °F | Min Temp °F | Rainfall (in.) |
|---|---|---|---|---|---|
| May 29 Dryland Trial | June 13 Irrigated Trial | | | | |
| **102** | **87** | **8-Sep** | 71.0 | 61.0 | 0.2 |
| **103** | **88** | **9-Sep** | 73.7 | 65.5 | 0 |
| **104** | **89** | **10-Sep** | 78.9 | 61.3 | 0 |
| **105** | **90** | **11-Sep** | 81.5 | 62.1 | 0 |
| **106** | **91** | **12-Sep** | 75.4 | 58.1 | 0 |
| | **92** | **13-Sep** | 73.8 | 55.8 | 0.13 |
| | **93** | **14-Sep** | 68.0 | 51.2 | 0 |
| | **94** | **15-Sep** | 72.9 | 45.2 | 0 |
| | **95** | **16-Sep** | 76.3 | 55.1 | 0.03 |
| | **96** | **17-Sep** | 74.2 | 50.5 | 0 |

**Appendix B: Weather Conditions During the 2014 Dryland Baby Lima Variety Trial May 29th (planting) to September 12th (final harvest)**



**Appendix C: Weather Conditions During the 2014 Irrigated Baby Lima Variety Trial June 13th (planting) to September 17th (final harvest)**



# 2014 Fordhook Lima Bean Variety Trial

The 2014 Fordhook Lima Bean Variety Trial included a total of 20 lines. Eighteen of the lines were from the University of Delaware lima bean breeding program. Concentrated Fordhook and Fordhook 242 were included in the trial as check varieties. The purpose of this trial is to evaluate advanced Fordhook breeding lines and other available varieties for yield, maturity, and quality under Delaware growing conditions.

**Varieties Entered in the 2014 Delaware Fordhook Lima Bean Variety Trial**

| Variety Name | Description |
|---|---|
| DE0701101 | UD Breeding Line |
| DE0600602B | UD Breeding Line |
| DE0701301A | UD Breeding Line |
| DE0804404C | UD Breeding Line |
| DE0600605C | UD Breeding Line |
| DE0803801A | UD Breeding Line |
| DE0803801B | UD Breeding Line |
| DE0700904 | UD Breeding Line |
| DE0900302A | UD Breeding Line |
| DE0803801C | UD Breeding Line |
| DE0804404A | UD Breeding Line |
| DE0701303B | UD Breeding Line |
| DE0804101A | UD Breeding Line |
| DE0804401C | UD Breeding Line |
| DE1002701A | UD Breeding Line |
| DE1002703A | UD Breeding Line |
| DE1002703B | UD Breeding Line |
| DE1002802A | UD Breeding Line |
| Concentrated FH | Standard Variety |
| FH 242 | Standard Variety |

***Location:***

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

***Cultural Practices:***

The trial was hand planted on June 26, 2014 into rows marked with a Monosem planter. Only the Concentrated Fordhook and Fordhook 242 seed was treated. Varieties were planted in one-row plots with 30 inch between row spacing and 6 inch in-row spacing. Plots were 10 feet in length and arranged in a randomized complete block design with three replications.

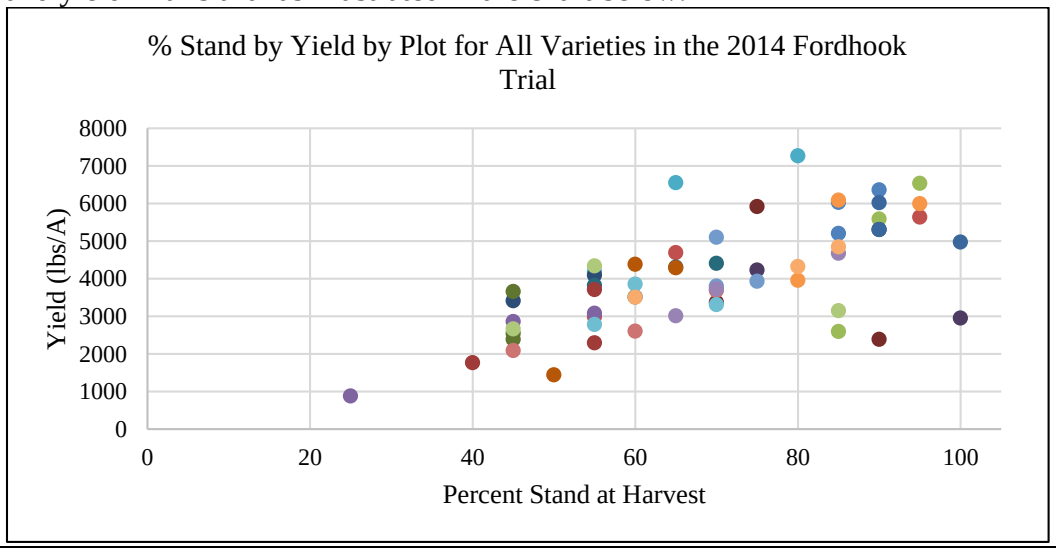
The field was fertilized with potassium (0-0-60) at a rate of 110 lbs/A before planting. A pre-emergence application of 1 pt/A Dual II Magnum + 0.75 oz/A Sandea for weed control as well as 49 lbs/A nitrogen in the form of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 49 lbs/A nitrogen in the form of 30% UAN was made. Additional hand weeding was done as necessary. Weed control in the trial was good. Phostrol was applied preventatively for downy mildew at a rate of 4 pts/A on August 18. No disease was observed in the plot but weather conditions were favorable for disease development in early and mid-August. No applications were made for insect control.

***Harvest:***
As harvest approached, plants were visually evaluated for maturity and plots were harvested when the majority of the pods were filled. Not all replications for a variety were harvested on the same day. Harvest began on September 22 (88 DAP) and ended on September 30 (96 DAP).

An 8 foot section from each plot was harvested. The plants were cut off at soil level and weighed. Pods were stripped from the harvested plants from each plot and counted as full, flat or dry. The pulled pods were shelled in a Model 520 "TaMaCo" huller from Taylor Manufacturing Co., Inc., Moultrie, GA. Any remaining trash was removed from the shelled beans by hand and the cleaned beans were weighed to determine yield. A random sample of 100 succulent beans from each plot was weighed to determine seed size.

***Quality Evaluation of Blanched and Frozen Samples of Fordhook Lima Varieties***
The processing quality of all 22 varieties in the Fordhook variety trial was evaluated by representatives of the regional processors at a meeting on December 16, 2014. Samples of beans harvested from the trial were washed and rotten, sprouted and split beans and plant debris were removed. Light colored beans were not graded out, and the samples were not graded for size. The cleaned samples were blanched for three minutes in boiling water, and then cooled immediately in ice water. Cooled beans were drained using a salad spinner then packed in Ziploc plastic bags and frozen at -10°F. Two commercially frozen Fordhook lima bean samples that were purchased at local grocery stores were included in the evaluation as controls. On the day of the evaluation the samples were thawed briefly in warm water, drained in a colander and a one cup sample was displayed in a white Styrofoam bowl. Samples were randomized and identified only by a number. The group of six evaluators was comprised of fieldmen, and processing and preprocessing quality experts from the four regional lima bean processors. Evaluators rated the samples for size, shape, color, and overall acceptability. Photos of the samples are online at http://extension.udel.edu/vegetableprogram/2015/02/06/2014-fordhook-quality-evaluation/.

**Results and Discussion**
Seedling emergence in this trial was variable. There is a strong correlation between final stand at harvest and yield in this trial as illustrated in the chart below.



Varieties with poor stands tended to have lower yields in the trial and those with higher stands tended to have higher yield. While some of the variability in final stand may have resulted from differences in seed age, quality, and seed treatment, there could also be genetic factors inherent to the variety that influence establishment. The varieties with the highest percent stand at harvest were FH 242, DE0701301A, DE0803801C, DE0701101, DE0803801A, and DE0700904. DE0701301A, DE0803801A and DE0700904 had at least 90% stands at harvest in both the 2012 and 2013.

This trial was planted in late June and experienced excellent conditions for growth and pod set with the cooler and wetter conditions this year. Overall, yields in this trial were high, but not as high as in 2013, perhaps because stands were not as good in this trial. The highest yielding varieties in the trial were DE0600605C, DE0701101, Fordhook 242, DE0803801A, DE0701301A, DE0600602B, and DE0804101A (Table 5). None of the varieties produced a significantly higher yield than FH 242, but five UD lines produced a significantly higher yield than Concentrated Fordhook: DE0600605C, DE0701101, DE0803801A, DE0701301A, and DE0600602B.

UD lines of particular interest because of yield and/or quality characteristics are as follows:

**DE0600605C** has had consistently high yields in the five years it has been trialed. The five year average yield for this line is 5084 lbs/A, or 183% of the yield of Concentrated Fordhook for those same years. DE0600605C was rated unacceptable for commercial production because of its light colored seed by the majority of evaluators in 2012 and 2014. It has been used as a parent for numerous Fordhook breeding lines that are still in development in the program.

**DE0600602B** has had consistently high yields in the five years it has been trialed. The five year average yield for this line is 4306 lbs/A, or 155% of the yield of Concentrated Fordhook for those same years. DE0600602B was rated unacceptable for commercial production because of its light colored seed by the majority of evaluators in 2012 and 2014. It has been used as a parent for numerous Fordhook breeding lines that are still in development in the program.

**DE0701301A** has been tested for four years and has performed well. The four year average yield for this line is 4156 lbs/A, or 162% of the yield of Concentrated Fordhook for those same years. Yield is not as high or as stable as the DE0600605C, but DE0701301A was rated overall acceptable by all of the 2012 evaluators and by half of the 2014 evaluators. It also had excellent emergence and final stand in the 2012, 2013 and 2014 trials.

**DE0804404A** has been tested for three years and has performed well in both years. The three year average yield for this line is 4107 lbs/A, or 130% of the yield of Concentrated Fordhook for those same years. Yield is not as high or as stable as the DE0600605C, but DE0804404A has commercial quality green seed and was rated acceptable by all of the 2012 and 2014 evaluators. Emergence and stand establishment are a potential problem with this variety.

**Table 5. Days to Harvest, Yield, Maturity at Harvest, Number of Pods per Plant, Plant Weight, and Percent Stand at Harvest, for Entries in the 2014 Fordhook Lima Bean Variety Trial**

| Variety | Days to Harvest | Yield (Lbs/A) | % Full Pods | % Flat Pods | % Dry Pods | # Pods/Plant | Plant Weight (lbs/8 ft) | % Stand[1] |
|---|---|---|---|---|---|---|---|---|
| DE0600605C | 92.7 abcd | 6001 a | 92.9 a | 2.4 efg | 4.7 a | 18.7 a | 11.9 ab | 66.7 def |
| DE0701101 | 94.3 abc | 5865 ab | 84.1 a | 7.2 abcde | 8.7 a | 10.2 a | 13.4 a | 86.7 abc |
| FH 242 | 89.3 de | 5433 abc | 91.8 a | 2.6 efg | 5.6 a | 14.4 a | 11.6 ab | 93.3 a |
| DE0803801A | 93.0 abcd | 5347 abc | 85.6 a | 4.5 cdefg | 9.9 a | 16.0 a | 11.6 ab | 86.7 abc |
| DE0701301A | 89.3 de | 4904 abcde | 89.5 a | 2.6 efg | 7.8 a | 14.5 a | 9.6 bcd | 90.0 ab |
| DE0600602B | 96.0 a | 4438 abcdef | 78.6 a | 8.6 abc | 12.8 a | 17.2 a | 10.4 abc | 71.7 cde |
| DE0804101A | 94.0 abc | 4279 abcdefg | 70.0 a | 11.0 ab | 19.0 a | 12.9 a | 10.7 abc | 71.7 cde |
| DE1002802A | 90.7 cde | 4224 bcdefg | 78.4 a | 11.3 ab | 10.3 a | 13.4 a | 9.4 bcd | 75.0 bcde |
| DE0804404A | 95.0 ab | 4179 bcdefg | 88.0 a | 2.6 efg | 9.4 a | 18.7 a | 8.4 bcd | 63.3 def |
| DE0803801C | 88.0 e | 4162 bcdefg | 83.5 a | 1.6 g | 14.9 a | 16.0 a | 7.6 cde | 88.3 abc |
| DE0700904 | 92.7 abcd | 3892 cdefgh | 78.9 a | 4.7 cdefg | 16.4 a | 16.3 a | 8.6 bcd | 78.3 abcd |
| DE1002703A | 91.7 bcde | 3804 cdefgh | 86.1 a | 1.9 fg | 12.0 a | 14.4 a | 7.3 cde | 73.3 bcde |
| DE0803801B | 91.7 bcde | 3673 defgh | 83.0 a | 3.3 defg | 13.7 a | 21.1 a | 7.5 cde | 53.3 fgh |
| DE1002701A | 91.0 cde | 3383 efgh | 78.7 a | 7.7 abcd | 13.6 a | 15.1 a | 6.6 de | 61.7 defg |
| DE0701303B | 93.7 abc | 3372 efgh | 79.6 a | 12.0 a | 8.4 a | 15.8 a | 7.2 cde | 58.3 efgh |
| DE1002703B | 93.3 abc | 3315 efgh | 85.2 a | 2.0 fg | 12.8 a | 14.3 a | 6.5 de | 61.7 defg |
| DE0900302A | 91.7 bcde | 2863 fgh | 83.3 a | 6.7 bcdef | 9.9 a | 18.5 a | 6.3 de | 45.0 gh |
| DE0804401C | 91.7 bcde | 2792 fgh | 87.2 a | 6.0 cdefg | 6.7 a | 16.0 a | 6.2 de | 58.3 efgh |
| Concentrated FH | 96.0 a | 2590 gh | 81.5 a | 12.2 a | 6.3 a | 14.1 a | 6.5 de | 50.0 fgh |
| DE0804404C | 92.3 abcd | 2271 h | 88.6 a | 3.9 cdefg | 7.5 a | 17.3 a | 4.6 e | 41.7 h |
| ***p-value*** | ***0.0088*** | ***0.0016*** | ***0.1133*** | ***<0.0001*** | ***0.6773*** | ***0.3965*** | ***0.0007*** | ***<0.0001*** |
| **Fisher's LSD[2]** | **3.9075** | **1742.1** | **NA** | **4.9944** | **NA** | **NA** | **3.7011** | **17.499** |
| **Tukey's HSD[3]** | **7.3375** | **3271.3** | **NA** | **9.3783** | **NA** | **NA** | **6.9499** | **32.86** |

[1]Percent stand is highlighted for varieties for which treated seed was planted.
[2]Means followed by the same letter are not significantly different according to Fisher's LSD.
[3]Minimum significant difference according to Tukey's HSD.

**Table 6. Days to Harvest, Yield, 100 Seed Weight, % Acceptability and Quality Defects from Quality Evaluation for Entries in the 2014 Fordhook Lima Bean Variety Trial**

| Variety | Days to Harvest | Yield (lbs/A) | 100 Seed Wt (g) | % of Evaluators Rating as Acceptable | Quality Defects |
|---|---|---|---|---|---|
| DE0600605C | 92.7 abcd | 6001 a | 240 a | 33.3 | color |
| DE0701101 | 94.3 abc | 5865 ab | 226 ab | 0.0 | color, shape, too small |
| FH 242 | 89.3 de | 5433 abc | 190 defg | 16.7 | color |
| DE0803801A | 93.0 abcd | 5347 abc | 219 abc | 16.7 | color, shape |
| DE0701301A | 89.3 de | 4904 abcde | 223 ab | 50.0 | color, shape, too small |
| DE0600602B | 96.0 a | 4438 abcdef | 229 ab | 16.7 | color, too big |
| DE0804101A | 94.0 abc | 4279 abcdefg | 209 bcd | 16.7 | color, too big, shape |
| DE1002802A | 90.7 cde | 4224 bcdefg | 193 de | 33.3 | color, shape, too small |
| DE0804404A | 95.0 ab | 4179 bcdefg | 175 efgh | 100.0 | too small |
| DE0803801C | 88.0 e | 4162 bcdefg | 145 i | 0.0 | color, shape, too small |
| DE0700904 | 92.7 abcd | 3892 cdefgh | 189 defg | 33.3 | color, shape, too small |
| DE1002703A | 91.7 bcde | 3804 cdefgh | 165 hi | 100.0 | |
| DE0803801B | 91.7 bcde | 3673 defgh | 169 fgh | 0.0 | color, too small |
| DE1002701A | 91.0 cde | 3383 efgh | 191 def | 100.0 | |
| DE0701303B | 93.7 abc | 3372 efgh | 197 cde | 33.3 | color |
| DE1002703B | 93.3 abc | 3315 efgh | 167 ghi | 80.0 | shape, too small |
| DE0900302A | 91.7 bcde | 2863 fgh | 184 efgh | 100.0 | |
| DE0804401C | 91.7 bcde | 2792 fgh | 175 efgh | 100.0 | |
| Concentrated FH | 96.0 a | 2590 gh | 196 cde | 66.7 | color |
| DE0804404C | 92.3 abcd | 2271 h | 169 fgh | 100.0 | too small |
| ***p-value*** | ***0.0088*** | ***0.0016*** | ***<0.0001*** | | |
| **Fisher's LSD[1]** | **3.9075** | **1742.1** | **22.937** | | |
| **Tukey's HSD[2]** | **7.3375** | **3271.3** | **43.071** | | |

[1]Means followed by the same letter are not significantly different according to Fisher's LSD.
[2]Minimum significant difference according to Tukey's HSD.

**Table 7. Processor Evaluator Ratings of Blanched and Frozen Samples of Succulent Fordhook Limas from the 2014 Georgetown Variety Trial**

| Variety | Percent of Evaluators Rating as Acceptable | | | |
|---|---|---|---|---|
| | Color | Shape | Size | Overall |
| DE1002703A | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0804401C | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0900302A | 100.0 | 100.0 | 100.0 | 100.0 |
| DE1002701A | 100.0 | 100.0 | 100.0 | 100.0 |
| DE0804404C | 100.0 | 100.0 | 83.3 | 100.0 |
| DE0804404A | 100.0 | 100.0 | 83.3 | 100.0 |
| DE1002703B | 100.0 | 80.0 | 80.0 | 80.0 |
| Concentrated Fordhook | 66.7 | 100.0 | 100.0 | 66.7 |
| Commercial Sample E* | 50.0 | 100.0 | 100.0 | 50.0 |
| DE0701301A | 50.0 | 83.3 | 83.3 | 50.0 |
| DE1002802A | 33.3 | 100.0 | 100.0 | 33.3 |
| DE0701303B | 33.3 | 100.0 | 100.0 | 33.3 |
| DE0600605C | 33.3 | 100.0 | 100.0 | 33.3 |
| Commercial Sample F* | 16.7 | 83.3 | 100.0 | 33.3 |
| DE0700904 | 16.7 | 83.3 | 83.3 | 33.3 |
| DE0803801A | 16.7 | 83.3 | 100.0 | 16.7 |
| Fordhook 242 | 0.0 | 100.0 | 100.0 | 16.7 |
| DE0600602B | 0.0 | 100.0 | 83.3 | 16.7 |
| DE0804101A | 16.7 | 83.3 | 50.0 | 16.7 |
| DE0803801B | 0.0 | 100.0 | 83.3 | 0.0 |
| DE0803801C | 0.0 | 83.3 | 83.3 | 0.0 |
| DE0701101 | 0.0 | 83.3 | 83.3 | 0.0 |

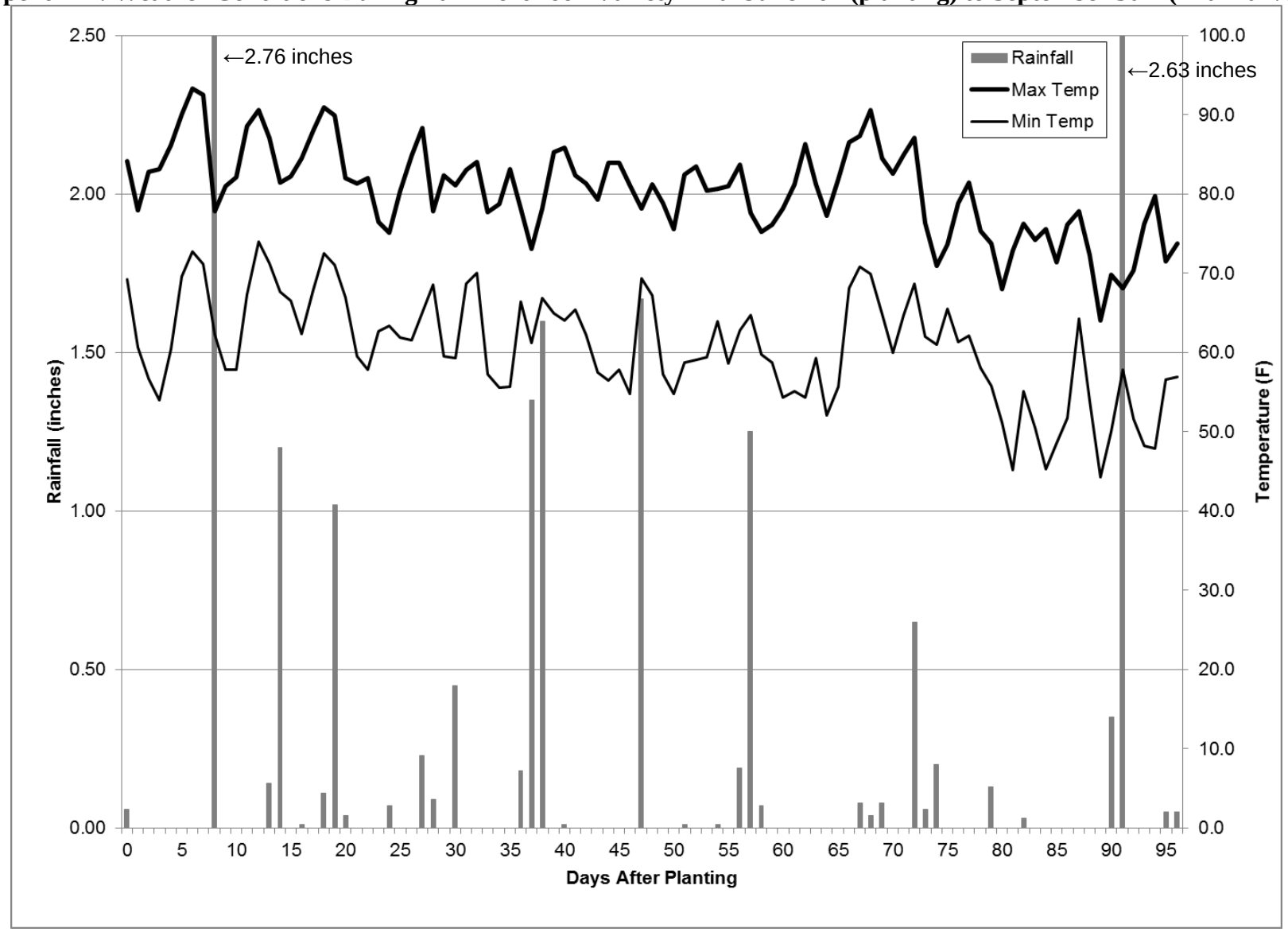
*Commercially frozen Fordhook lima beans purchased at local grocery stores

## Appendix E: Weather Data for 2014 Fordhook Lima Variety Trial
## June 26th (planting) to September 30th (final harvest)

| DAP | Date | Max Temp °F | Min Temp °F | Rainfall (in.) |
|---|---|---|---|---|
| **0** | **26-Jun** | 84.2 | 69.3 | 0.06 |
| **1** | **27-Jun** | 78.0 | 60.7 | 0 |
| **2** | **28-Jun** | 82.8 | 56.7 | 0 |
| **3** | **29-Jun** | 83.2 | 54.0 | 0 |
| **4** | **30-Jun** | 86.2 | 60.5 | 0 |
| **5** | **1-Jul** | 90.1 | 69.6 | 0 |
| **6** | **2-Jul** | 93.3 | 72.8 | 0 |
| **7** | **3-Jul** | 92.5 | 71.2 | 0 |
| **8** | **4-Jul** | 77.9 | 62.3 | 2.76 |
| **9** | **5-Jul** | 81.0 | 57.9 | 0 |
| **10** | **6-Jul** | 82.1 | 57.9 | 0 |
| **11** | **7-Jul** | 88.6 | 67.3 | 0 |
| **12** | **8-Jul** | 90.6 | 74.0 | 0 |
| **13** | **9-Jul** | 87.1 | 71.3 | 0.14 |
| **14** | **10-Jul** | 81.5 | 67.7 | 1.2 |
| **15** | **11-Jul** | 82.3 | 66.6 | 0 |
| **16** | **12-Jul** | 84.5 | 62.4 | 0.01 |
| **17** | **13-Jul** | 88.0 | 67.9 | 0 |
| **18** | **14-Jul** | 91.0 | 72.5 | 0.11 |
| **19** | **15-Jul** | 89.9 | 71.1 | 1.02 |
| **20** | **16-Jul** | 82.0 | 67.0 | 0.04 |
| **21** | **17-Jul** | 81.4 | 59.6 | 0 |
| **22** | **18-Jul** | 82.0 | 57.9 | 0 |
| **23** | **19-Jul** | 76.5 | 62.7 | 0 |
| **24** | **20-Jul** | 75.1 | 63.4 | 0.07 |
| **25** | **21-Jul** | 80.3 | 61.9 | 0 |
| **26** | **22-Jul** | 84.9 | 61.6 | 0 |
| **27** | **23-Jul** | 88.4 | 65.1 | 0.23 |
| **28** | **24-Jul** | 77.9 | 68.6 | 0.09 |
| **29** | **25-Jul** | 82.4 | 59.5 | 0 |
| **30** | **26-Jul** | 81.1 | 59.3 | 0.45 |
| **31** | **27-Jul** | 83.0 | 68.7 | 0 |
| **32** | **28-Jul** | 84.1 | 70.0 | 0 |
| **33** | **29-Jul** | 77.7 | 57.3 | 0 |
| **34** | **30-Jul** | 78.8 | 55.6 | 0 |
| **35** | **31-Jul** | 83.2 | 55.7 | 0 |
| **36** | **1-Aug** | 78.2 | 66.4 | 0.18 |
| **37** | **2-Aug** | 73.1 | 61.2 | 1.35 |
| **38** | **3-Aug** | 78.2 | 66.9 | 1.6 |
| **39** | **4-Aug** | 85.3 | 65.0 | 0 |
| **40** | **5-Aug** | 85.9 | 64.1 | 0.01 |
| **41** | **6-Aug** | 82.4 | 65.4 | 0 |
| **42** | **7-Aug** | 81.4 | 62.3 | 0 |
| **43** | **8-Aug** | 79.3 | 57.5 | 0 |
| **44** | **9-Aug** | 83.9 | 56.5 | 0 |
| **45** | **10-Aug** | 84.0 | 57.9 | 0 |
| **46** | **11-Aug** | 81.1 | 54.8 | 0 |
| **47** | **12-Aug** | 78.2 | 69.4 | 1.67 |

| DAP | Date | Max Temp °F | Min Temp °F | Rainfall (in.) |
|---|---|---|---|---|
| **48** | **13-Aug** | 81.2 | 67.2 | 0 |
| **49** | **14-Aug** | 78.9 | 57.3 | 0 |
| **50** | **15-Aug** | 75.6 | 54.8 | 0 |
| **51** | **16-Aug** | 82.5 | 58.7 | 0.01 |
| **52** | **17-Aug** | 83.5 | 59.1 | 0 |
| **53** | **18-Aug** | 80.4 | 59.4 | 0 |
| **54** | **19-Aug** | 80.7 | 63.9 | 0.01 |
| **55** | **20-Aug** | 81.0 | 58.6 | 0 |
| **56** | **21-Aug** | 83.7 | 62.8 | 0.19 |
| **57** | **22-Aug** | 77.6 | 64.7 | 1.25 |
| **58** | **23-Aug** | 75.3 | 59.8 | 0.07 |
| **59** | **24-Aug** | 76.2 | 58.7 | 0 |
| **60** | **25-Aug** | 78.2 | 54.4 | 0 |
| **61** | **26-Aug** | 81.2 | 55.1 | 0 |
| **62** | **27-Aug** | 86.3 | 54.3 | 0 |
| **63** | **28-Aug** | 81.2 | 59.3 | 0 |
| **64** | **29-Aug** | 77.3 | 52.1 | 0 |
| **65** | **30-Aug** | 81.9 | 55.7 | 0 |
| **66** | **31-Aug** | 86.5 | 68.1 | 0 |
| **67** | **1-Sep** | 87.3 | 70.8 | 0.08 |
| **68** | **2-Sep** | 90.6 | 69.9 | 0.04 |
| **69** | **3-Sep** | 84.5 | 64.8 | 0.08 |
| **70** | **4-Sep** | 82.6 | 60.0 | 0 |
| **71** | **5-Sep** | 85.0 | 64.7 | 0 |
| **72** | **6-Sep** | 87.1 | 68.7 | 0.65 |
| **73** | **7-Sep** | 76.4 | 62.0 | 0.06 |
| **74** | **8-Sep** | 71.0 | 61.0 | 0.2 |
| **75** | **9-Sep** | 73.7 | 65.5 | 0 |
| **76** | **10-Sep** | 78.9 | 61.3 | 0 |
| **77** | **11-Sep** | 81.5 | 62.1 | 0 |
| **78** | **12-Sep** | 75.4 | 58.1 | 0 |
| **79** | **13-Sep** | 73.8 | 55.8 | 0.13 |
| **80** | **14-Sep** | 68.0 | 51.2 | 0 |
| **81** | **15-Sep** | 72.9 | 45.2 | 0 |
| **82** | **16-Sep** | 76.3 | 55.1 | 0.03 |
| **83** | **17-Sep** | 74.2 | 50.5 | 0 |
| **84** | **18-Sep** | 75.6 | 45.3 | 0 |
| **85** | **19-Sep** | 71.4 | 48.6 | 0 |
| **86** | **20-Sep** | 76.1 | 51.7 | 0 |
| **87** | **21-Sep** | 77.8 | 64.3 | 0 |
| **88** | **22-Sep** | 72.3 | 53.9 | 0 |
| **89** | **23-Sep** | 64.1 | 44.3 | 0 |
| **90** | **24-Sep** | 69.8 | 50 | 0.35 |
| **91** | **25-Sep** | 68.1 | 57.8 | 2.63 |
| **92** | **26-Sep** | 70.4 | 51.6 | 0 |
| **93** | **27-Sep** | 76.3 | 48.2 | 0 |
| **94** | **28-Sep** | 79.8 | 47.9 | 0 |
| **95** | **29-Sep** | 71.5 | 56.6 | 0.05 |
| **96** | **30-Sep** | 73.8 | 57 | 0.05 |

**Appendix F: Weather Conditions During 2014 Fordhook Variety Trial June 26th (planting) to September 30th (final harvest)**



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