

**UNIVERSITY OF  
DELAWARE**



# LIMA BEAN

**VARIETY**

**TRIAL**

**RESULTS**

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**University of Delaware  
Research and Education Center  
16483 County Seat Highway  
Georgetown, DE 19947**

**2013**

**2013 UNIVERSITY OF DELAWARE GREEN BABY LIMA BEAN AND FORDHOOK  
LIMA BEAN VARIETY TRIALS**

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**2013 Baby Lima Bean Variety Trials**

In 2013 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 31, 2013**

The Unirrigated Baby Lima Bean Variety Trial included a total of 32 lines and was planted on May 31. 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 6 D-2 at the University of Delaware Research and Education Center Farm, Georgetown, DE

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

The trial was planted on May 31, 2013 with a Jang TD1 Precision Seeder 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. The field was fertilized with potassium (0-0-60) at a rate of 110 lbs/A before planting. A pre-emergence application of 1.3 pt/A Dual II Magnum for weed control as well as 40 lbs/A nitrogen in the form of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 40 lbs/A nitrogen in the form of 30% UAN was made. Additional hand weeding was done as necessary. Weed control in the trial was satisfactory. Phostrol was applied preventatively for downy mildew at a rate of 4 pts/A. 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 26 (87 DAP) and ended on September 18 (110 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 31, 2013**

| <b>Line</b>    | <b>Description</b>     |
|----------------|------------------------|
| DE0900603A     | UD dryland selection   |
| DE0900604A     | UD dryland selection   |
| DE0900604B     | UD dryland selection   |
| DE0900701D     | UD dryland selection   |
| DE0900703A     | UD dryland selection   |
| DE0900802A     | UD dryland selection   |
| DE0901101C     | UD dryland selection   |
| DE0901201A     | UD dryland selection   |
| DE0901204A     | UD dryland selection   |
| DE0901204B     | UD dryland selection   |
| DE0901204C     | UD irrigated selection |
| DE0901204D     | UD dryland selection   |
| DE0901502A     | UD dryland selection   |
| DE0901502B     | UD dryland selection   |
| DE0901601B     | UD dryland selection   |
| DE0900704A     | UD dryland selection   |
| DE0900705C     | UD dryland selection   |
| DE0900705E     | UD dryland selection   |
| DE0901206D     | UD dryland selection   |
| DE0901404B     | UD dryland selection   |
| DE0901805A     | UD dryland selection   |
| DE0901805B     | UD dryland selection   |
| DE0901805D     | UD dryland selection   |
| DE0901805E     | UD dryland selection   |
| DE0901902B     | UD dryland selection   |
| DE0802101A     | UD dryland selection   |
| DE0802702C     | UD dryland selection   |
| DE0505002A     | UD irrigated selection |
| DE0407907      | UD irrigated selection |
| DE0407905      | UD irrigated selection |
| C-elite Select | Standard variety       |
| Cypress        | Standard variety       |

**Irrigated Baby Lima Bean Variety Trial at Georgetown, DE – Planted June 13, 2013**

The Irrigated Baby Lima Bean Variety Trial was planted on June 13 and included a total of 50 lines. Eight of the lines were entered by the two participating seed companies: ADM Seedwest and Ben Fish & Son. Thirty-eight 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, 2013**

| <b>Variety Name</b> | <b>Source</b>               | <b>Variety Name</b> | <b>Source</b>          |
|---------------------|-----------------------------|---------------------|------------------------|
| G200381             | ADM                         | DE0901204C          | University of Delaware |
| G200382             | ADM                         | DE0901204D          | University of Delaware |
| G9002033            | ADM                         | DE0901502A          | University of Delaware |
| G700801             | ADM                         | DE0901502B          | University of Delaware |
| Cypress             | ADM (standard variety)      | DE0901601B          | University of Delaware |
| Meadow              | ADM (standard variety)      | DE0901601C          | University of Delaware |
| GBL 21-04           | Ben Fish                    | DE0900704A          | University of Delaware |
| GBL 24-04           | Ben Fish                    | DE0900705C          | University of Delaware |
| GBL 26-04           | Ben Fish                    | DE0901206D          | University of Delaware |
| GBL-1000 GS         | Ben Fish                    | DE0901805A          | University of Delaware |
| GBL 184-85          | Ben Fish (standard variety) | DE0901805B          | University of Delaware |
| C-elite Select      | Ben Fish (standard variety) | DE0901805D          | University of Delaware |
| DE0900603A          | University of Delaware      | DE0901805E          | University of Delaware |
| DE0900604A          | University of Delaware      | DE0802101A          | University of Delaware |
| DE0900604B          | University of Delaware      | DE0802702C          | University of Delaware |
| DE0900701C          | University of Delaware      | DE0802102B          | University of Delaware |
| DE0900701D          | University of Delaware      | DE0802102A          | University of Delaware |
| DE0900703A          | University of Delaware      | DE0802102C          | University of Delaware |
| DE0900802A          | University of Delaware      | DE0802702A          | University of Delaware |
| DE0901101C          | University of Delaware      | DE0801802B          | University of Delaware |
| DE0901101D          | University of Delaware      | DE0802701B          | University of Delaware |
| DE0901201A          | University of Delaware      | DE0505002A          | University of Delaware |
| DE0901201B          | University of Delaware      | DE0407907           | University of Delaware |
| DE0901204A          | University of Delaware      | DE0407905           | University of Delaware |
| DE0901204B          | University of Delaware      | DE0501801A          | University of Delaware |

***Location:***

Field 13-A/11-A at the University of Delaware Research and Education Center Farm, Georgetown, DE

***Cultural Practices:***

The trial was planted on June 13, 2013 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 1.3 pt/A Dual II Magnum for weed control as well as 40 lbs/A nitrogen in the form

of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 40 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. 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 26 (74 DAP) and ended on September 16 (95 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.

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

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

Weather conditions in 2013 were wetter and cooler than they have been for the past three seasons (2010-2012 were the three warmest summers on record for Delaware). As a result, we did not see the same delay of maturity in the standard varieties that we have seen in the past three years in the irrigated baby lima trial. Maturity for Cypress was on par with the historical average. C-elite and 184-85 had slightly longer days to maturity than the historical average, but this may have been because the trial was plated approximately a week later than it was in 2006-2009, exposing the longer-season varieties to more cool temperature at the end of the season. 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           |
| <i>Planting Date</i> |   | <i>June 6</i> | <i>June 6</i> | <i>June 14</i> | <i>June 13</i> |
| Cypress              | 77  | 91            | 97            | 82             | 77             |
| C-elite Select       | 84  | 96            | 98            | 89             | 89             |
| 184-85               | 86  | 95            | 99            | 88             | 89             |

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

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

The dryland baby lima trial was planted on May 31 and despite the higher than average rainfall this season, was exposed to more environmental stress than the irrigated trial. All of the varieties in the trial had split or delayed sets due to heat stress that occurred during flowering in July. (The irrigated trial, which was planted two weeks later, was not flowering during the hottest part of

July.) The field where this trial was planted is extremely sandy, and plants did experience some drought stress late in the season despite the high amounts of rainfall early in the season.

#### ***Yield and Maturity in the Dryland Baby Lima Trial***

The purpose of the May 31- 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). Only one variety, DE0900603A, was significantly higher yielding than C-elite Select, but it was also one of the latest maturing varieties in the trial. Seven varieties (DE0900603A, DE0900604A, DE0901902B, DE0901201A, DE0901204A, DE0901204D and DE0407907) had significantly higher yields than Cypress, which was one of the lowest yielding varieties in the trial. However, all of these varieties were much later to mature than Cypress. DE0407905 was the highest yielding variety that matured early in the trial (Figure 1). DE0407905 has been tested in the irrigated variety trial for six years (since 2008) and is being considered for release.

#### ***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). The two highest yielding varieties were DE0900604B and DE0900603A. The yield of DE0900604B was significantly higher than all of the other varieties in the trial except DE0900603A. In addition to the two previously mentioned varieties, DE0900604A had significantly higher yields than C-elite Select, the highest yielding standard variety in the trial. Many of the highest yielding breeding lines in the trial were not green seeded (Table 4 and Figure 2). The highest yielding green-seeded line was DE0901204B, but this variety was very late to mature at 95 days to harvest.

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

**DE0407905** matured in 86 days and yielded 4700 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. In this trial as in past trials, DE0407905 was a few days earlier to mature than C-elite Select.

**DE0407907** matured in 86 days and yielded 4497 lbs/A. Yield was numerically lower but not significantly different than that of C-elite Select in this trial, but it was significantly higher than GBL 184-85, Cypress and Meadow. 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.

**DE0802102B** matured in 80 days and yielded 4914 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. DE0802102B was evaluated for the first time in the 2012 trial, but was not replicated because of insufficient seed. Its unreplicated 2012 yield was 4999 lbs/A at 85 days to harvest. DE0802102B is of particular interest because it has had significantly higher yields than the other early maturing varieties.

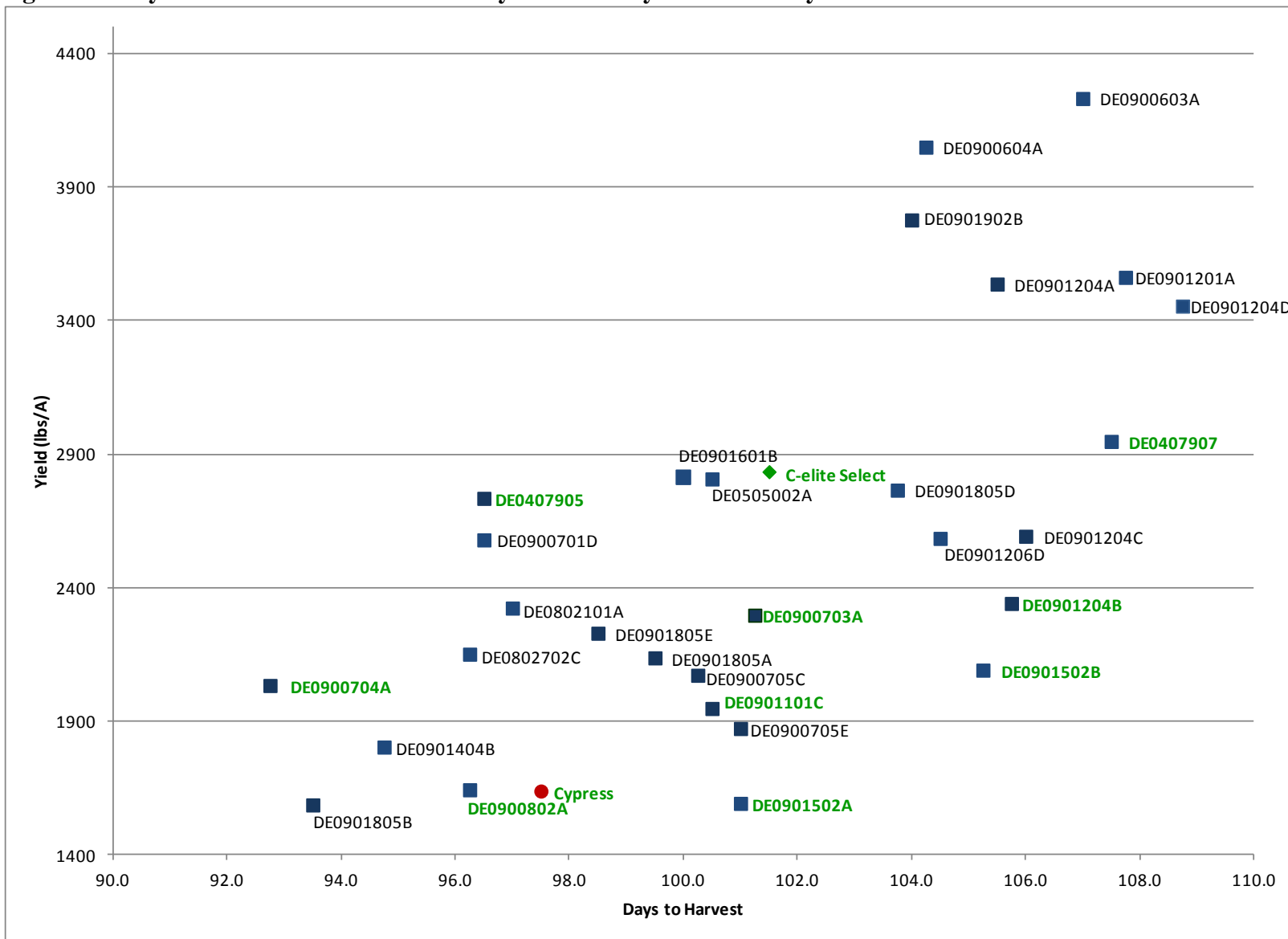
Among the varieties entered by ADM, G200381 and G200382 had significantly higher yields than Cypress. Both of these varieties performed well in the 2011 and 2012 trials. Maturity for these two varieties was nearly identical to Cypress in past trials but was slightly later than Cypress in the 2013 trial.

Experimental varieties entered by Ben Fish were similar in yield and maturity to C-elite Select, except for GBL-1000 GS, which matured in 82 days, about a week earlier than C-elite Select.

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 slightly more variable this year than it was in 2012, the first year for which this statistic is reported for the trial. 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 one of the commercial standards, Cypress or C-elite Select (Figure 3), although a few of the UD breeding lines were significantly larger than both of the standards. With the exception of DE0900704A, these lines all also have seedcoat and cotyledon color characteristics that make them commercially unacceptable and therefore useful only as parents in the breeding program.

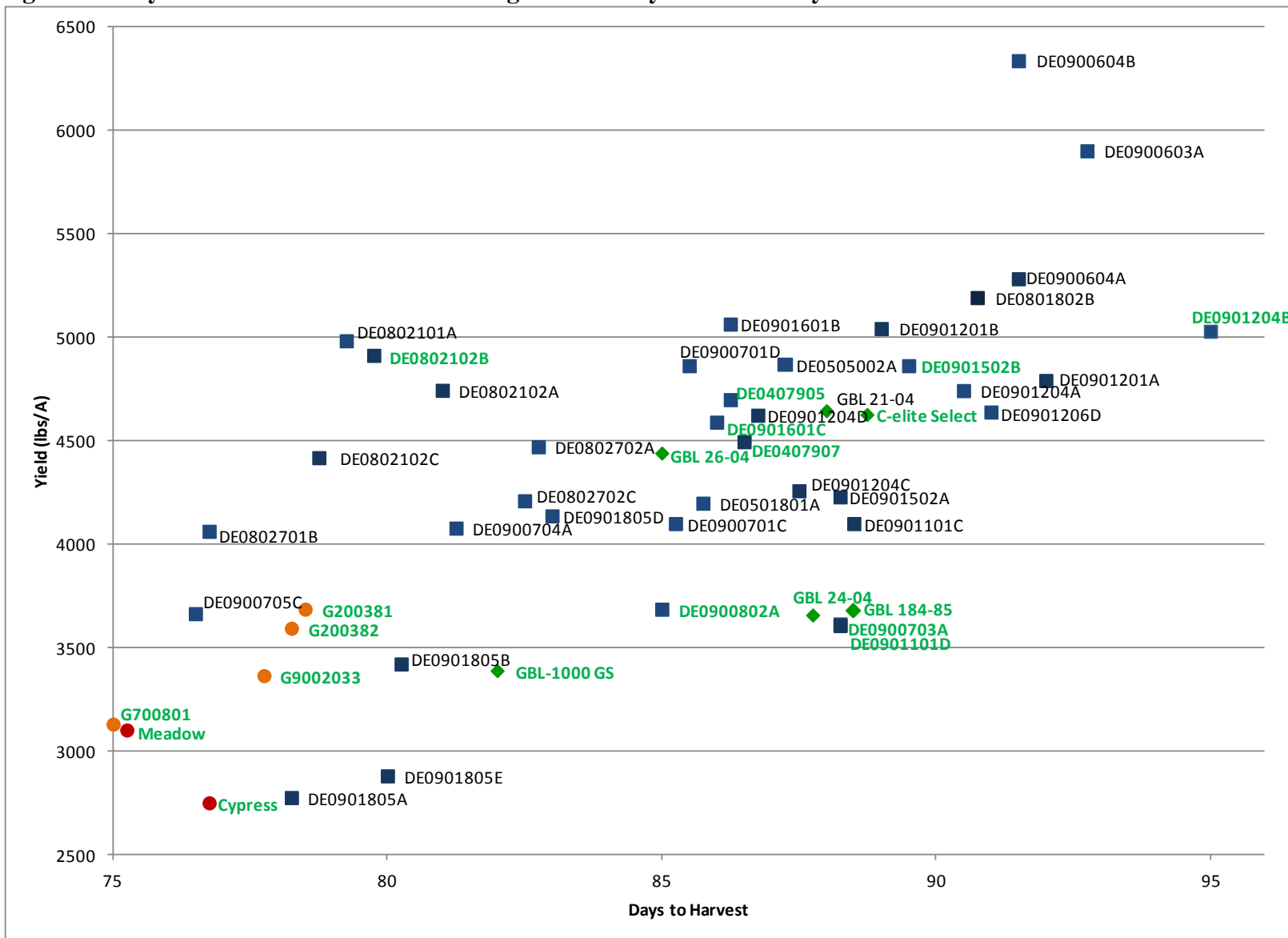
**Figure 1. Baby Lima Bean Varieties in the Dryland Trial by Yield and Days to Harvest\***



\* Green-seeded varieties are indicated by green data point labels.

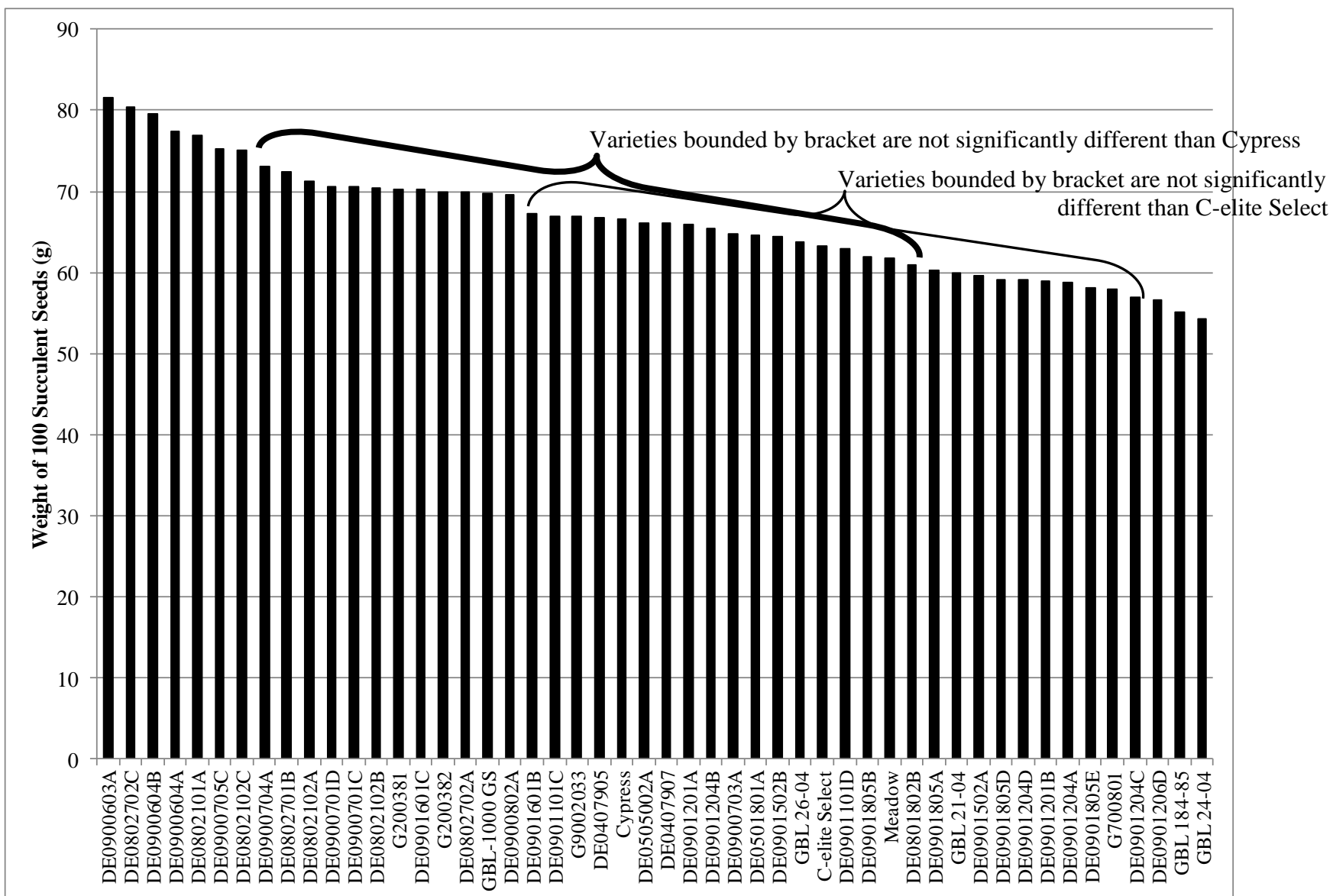


**Figure 2. Baby Lima Bean Varieties in the Irrigated Trial by Yield and Days to Harvest\***



\* Green-seeded varieties are indicated by green data point labels.

**Figure 3. Baby Lima Bean Varieties in the 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 31, 2013**

| Variety                         | Days to Harvest | Yield (Lbs/A) | Plant Weight (Lbs/10 ft) | % Stand <sup>1</sup> |
|---------------------------------|-----------------|---------------|--------------------------|----------------------|
| DE0900603A                      | 107.0 ab        | 4233 a        | 12.6 a-c                 | 77 a                 |
| DE0900604A                      | 104.3 a-e       | 4051 ab       | 13.7 a                   | 90 a                 |
| DE0901902B                      | 104.0 a-f       | 3778 a-c      | 12.1 a-d                 | 87 a                 |
| DE0900604B                      | 101.8 a-g       | 3665 a-d      | 11.9 a-d                 | 91 a                 |
| DE0901201A                      | 107.8 ab        | 3563 a-e      | 13.1 ab                  | 76 a                 |
| DE0901204A                      | 105.5 a-e       | 3544 a-f      | 13.8 a                   | 93 a                 |
| DE0901204D                      | 108.8 a         | 3455 a-g      | 12.0 a-d                 | 91 a                 |
| DE0407907                       | 107.5 ab        | 2948 a-h      | 10.3 a-g                 | 75 a                 |
| C-elite Select                  | 101.5 a-g       | 2835 b-i      | 11.3 a-e                 | 80 a                 |
| DE0901601B                      | 100.0 a-g       | 2814 b-i      | 8.9 c-i                  | 88 a                 |
| DE0505002A                      | 100.5 a-g       | 2808 b-i      | 9.0 c-i                  | 82 a                 |
| DE0901805D                      | 103.8 a-f       | 2766 b-i      | 10.8 a-f                 | 94 a                 |
| DE0407905                       | 96.5 d-g        | 2735 b-i      | 10.4 a-f                 | 77 a                 |
| DE0901204C                      | 106.0 a-c       | 2593 c-i      | 8.8 c-i                  | 72 a                 |
| DE0901206D                      | 104.5 a-e       | 2585 c-i      | 9.1 c-i                  | 73 a                 |
| DE0900701D                      | 96.5 d-g        | 2580 c-i      | 9.6 b-h                  | 88 a                 |
| DE0901204B                      | 105.8 a-d       | 2341 d-i      | 9.3 b-h                  | 63 a                 |
| DE0802101A                      | 97.0 c-g        | 2324 e-i      | 7.6 e-i                  | 73 a                 |
| DE0900703A                      | 101.3 a-g       | 2297 e-i      | 9.4 b-h                  | 75 a                 |
| DE0901805E                      | 98.5 b-g        | 2230 f-i      | 9.6 b-h                  | 83 a                 |
| DE0802702C                      | 96.3 e-g        | 2151 g-i      | 6.4 g-i                  | 72 a                 |
| DE0901805A                      | 99.5 a-g        | 2138 g-i      | 8.8 c-i                  | 94 a                 |
| DE0901502B                      | 105.3 a-e       | 2092 h-i      | 6.4 g-i                  | 71 a                 |
| DE0900705C                      | 100.3 a-g       | 2072 h-i      | 8.6 d-i                  | 84 a                 |
| DE0900704A                      | 92.8 g          | 2034 h-i      | 7.7 e-i                  | 79 a                 |
| DE0901502A                      | 101.0 a-g       | 2008 h-i      | 7.0 f-i                  | 86 a                 |
| DE0901101C                      | 100.5 a-g       | 1948 h-i      | 8.2 d-i                  | 73 a                 |
| DE0900705E                      | 101.0 a-g       | 1873 h-i      | 8.7 c-i                  | 67 a                 |
| DE0901404B                      | 94.8 fg         | 1803 h-i      | 7.4 f-i                  | 71 a                 |
| DE0900802A                      | 96.3 e-g        | 1652 h-i      | 7.1 f-i                  | 65 a                 |
| Cypress                         | 97.5 c-g        | 1639 h-i      | 5.3 i                    | 64 a                 |
| DE0901805B                      | 93.5 g          | 1587 i        | 6.3 hi                   | 70 a                 |
| <i>p-value</i>                  | <b>0.0212</b>   | <b>0.0007</b> | <b>0.0002</b>            | <b>0.3599</b>        |
| <b>Fisher's LSD<sup>2</sup></b> | <b>9.31</b>     | <b>1324</b>   | <b>3.9155</b>            | <b>NA</b>            |
| <b>Tukey's HSD<sup>3</sup></b>  | <b>*18.32</b>   | <b>2604</b>   | <b>7.6971</b>            | <b>NA</b>            |

<sup>1</sup>Percent stand is highlighted for varieties for which treated seed was planted.

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD. For starred HSD values there are no significant differences according to the Tukey test.

**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, 2013**

| Variety                         | Days to Harvest   | Yield (Lbs/A)     | % Full Pods   | % Flat Pods       | % Dry Pods    | # Pods/Plant  | Plant Weight (Lbs/15 ft) | % Stand <sup>1</sup> |
|---------------------------------|-------------------|-------------------|---------------|-------------------|---------------|---------------|--------------------------|----------------------|
| DE0900604B                      | 91.5 b-d          | 6338 a            | 84.0 a-e      | 1.8 o             | 14.3 a-k      | 27 a-g        | 25.0 a-f                 | 91 a-d               |
| DE0900603A                      | 92.8 ab           | 5903 ab           | 79.3 b-j      | 4.3 j-o           | 16.8 a-g      | 24 c-i        | 26.2 a-d                 | 91 a-d               |
| DE0900604A                      | 91.5 b-d          | 5285 bc           | 87.0 a-c      | 5.0 i-o           | 8.0 e-m       | 21 f-i        | 24.9 a-g                 | 93 ab                |
| DE0801802B                      | 90.8 b-f          | 5194 b-d          | 91.8 a        | 3.5 l-o           | 5.0 j-m       | 31 a-c        | 25.2 a-e                 | 90 a-e               |
| DE0901601B                      | 86.3 i-n          | 5066 cd           | 73.3 e-k      | 14.3 a-j          | 12.3 a-m      | 25 c-i        | 25.7 a-e                 | 91 a-d               |
| DE0901201B                      | 89.0 d-i          | 5044 cd           | 76.8 c-k      | 4.0 l-o           | 19.3 a-c      | 27 b-i        | 22.9 a-m                 | 92 a-d               |
| DE0901204B                      | 95.0 a            | 5031 c-e          | 84.8 a-d      | 2.3 no            | 13.5 a-k      | 29 a-e        | 26.3 a-c                 | 90 a-e               |
| DE0802101A                      | 79.3 u-y          | 4985 d-f          | 85.3 a-d      | 5.5 h-o           | 9.3 d-m       | 24 c-i        | 18.3 n-r                 | 91 a-e               |
| DE0802102B                      | 79.8 t-x          | 4914 d-g          | 85.5 a-d      | 3.5 l-o           | 11.0 b-m      | 28 a-f        | 19.5 i-r                 | 93 ab                |
| DE0505002A                      | 87.3 h-n          | 4867 d-h          | 85.0 a-d      | 3.3 m-o           | 11.5 b-m      | 24 c-i        | 22.9 a-m                 | 90 a-e               |
| DE0900701D                      | 85.5 l-p          | 4864 d-h          | 80.3 b-j      | 17.5 a-f          | 2.5 m         | 28 a-f        | 26.7 ab                  | 89 a-f               |
| DE0901502B                      | 89.5 c-h          | 4864 d-h          | 76.3 c-k      | 2.3 no            | 22.0 a        | 24 d-i        | 22.6 b-n                 | 93 a-c               |
| DE0901201A                      | 92.0 bc           | 4793 d-i          | 77.8 b-j      | 5.0 i-o           | 17.3 a-e      | 29 a-e        | 23.8 a-i                 | 91 a-e               |
| DE0802102A                      | 81.0 r-w          | 4745 d-i          | 83.0 a-f      | 1.5 o             | 15.5 a-i      | 24 d-i        | 19.8 i-r                 | 90 a-e               |
| DE0901204A                      | 90.5 b-g          | 4744 d-i          | 72.0 f-k      | 9.0 d-o           | 19.3 a-c      | 23 d-i        | 27.1 a                   | 92 a-d               |
| DE0407905                       | 86.3 i-n          | 4700 d-i          | 79.0 b-j      | 5.5 h-o           | 15.3 a-i      | 24 d-i        | 24.4 a-h                 | 95 a                 |
| GBL 21-04                       | 88.0 f-m          | 4647 d-i          | 81.3 a-i      | 2.8 no            | 16.3 a-h      | 32 ab         | 22.2 c-o                 | 68 h                 |
| DE0901206D                      | 91.0 b-e          | 4640 d-i          | 82.8 a-g      | 5.0 i-o           | 12.0 b-m      | 27 a-h        | 23.0 a-l                 | 92 a-d               |
| C-elite Select                  | 88.8 d-j          | 4628 d-i          | 70.3 i-k      | 9.3 c-o           | 20.5 ab       | 28 a-f        | 22.4 b-n                 | 86 b-f               |
| DE0901204D                      | 86.8 h-n          | 4625 d-i          | 79.3 b-j      | 11.3 b-o          | 9.5 c-m       | 28 a-e        | 25.7 a-e                 | 91 a-d               |
| DE0901601C                      | 86.0 j-n          | 4592 d-i          | 79.8 b-j      | 8.5 e-o           | 11.8 b-m      | 24 c-i        | 23.4 a-j                 | 84 d-f               |
| DE0407907                       | 86.5 i-n          | 4497 d-i          | 82.5 a-h      | 2.8 no            | 14.8 a-j      | 26 c-i        | 22.4 b-n                 | 92 a-d               |
| DE0802702A                      | 82.8 p-s          | 4473 d-i          | 71.8 g-k      | 8.5 e-o           | 20.5 ab       | 21 g-i        | 23.1 a-k                 | 89 a-f               |
| GBL 26-04                       | 85.0 n-q          | 4442 d-j          | 85.5 a-d      | 7.5 f-o           | 7.0 g-m       | 33 a          | 19.6 i-r                 | 81 fg                |
| DE0802102C                      | 78.8 v-y          | 4420 d-k          | 83.0 a-f      | 10.3 c-o          | 7.0 g-m       | 26 c-i        | 22.0 c-p                 | 93 ab                |
| DE0901204C                      | 87.5 h-n          | 4260 e-l          | 74.8 d-k      | 9.5 c-o           | 15.8 a-i      | 27 a-f        | 21.8 d-q                 | 89 a-f               |
| DE0901502A                      | 88.3 e-l          | 4231 f-l          | 79.0 b-j      | 2.5 no            | 18.3 a-d      | 23 d-i        | 20.4 g-q                 | 91 a-d               |
| DE0802702C                      | 82.5 q-t          | 4212 f-l          | 88.0 ab       | 5.0 i-o           | 7.3 f-m       | 25 c-i        | 20.2 h-q                 | 91 a-d               |
| DE0501801A                      | 85.8 k-o          | 4200 g-m          | 71.5 h-k      | 18.3 a-e          | 9.8 c-m       | 21 g-i        | 25.1 a-e                 | 95 a                 |
| DE0901805D                      | 83.0 o-r          | 4139 g-n          | 70.0 jk       | 17.0 a-g          | 13.3 a-k      | 23 d-i        | 21.4 e-q                 | 92 a-d               |
| DE0900701C                      | 85.3 m-           | 4101 h-n          | 79.8 b-j      | 13.0 a-m          | 7.3 f-m       | 24 d-i        | 21.6 e-q                 | 90 a-e               |
| DE0901101C                      | 88.5 e-k          | 4101 h-n          | 79.0 b-j      | 4.0 d-o           | 17.0 a-f      | 24 c-i        | 23.0 a-l                 | 90 a-e               |
| DE0900704A                      | 81.3 r-v          | 4080 i-n          | 75.0 d-k      | 13.5 a-l          | 11.8 b-m      | 24 d-i        | 18.3 n-r                 | 95 a                 |
| DE0802701B                      | 76.8 yz           | 4064 i-n          | 82.5 a-h      | 8.3 e-o           | 9.0 d-m       | 26 b-i        | 17.4 q-s                 | 93 a-c               |
| G200381                         | 78.5 v-y          | 3688 j-o          | 77.5 b-k      | 14.0 a-k          | 8.0 e-m       | 24 d-i        | 20.1 h-q                 | 91 a-e               |
| DE0900802A                      | 85.0 o-q          | 3688 j-o          | 76.5 c-k      | 7.3 g-o           | 16.0 a-h      | 21 f-i        | 17.9 o-r                 | 87 a-f               |
| GBL 184-85                      | 88.5 e-k          | 3677 j-o          | 77.8 b-j      | 7.8 f-o           | 14.8 a-j      | 24 d-i        | 19.8 i-r                 | 83 ef                |
| <i>p-value</i>                  | <b>&lt;0.0001</b> | <b>&lt;0.0001</b> | <b>0.0013</b> | <b>&lt;0.0001</b> | <b>0.0018</b> | <b>0.0185</b> | <b>&lt;0.0001</b>        | <b>&lt;0.0001</b>    |
| <b>Fisher's LSD<sup>2</sup></b> | <b>2.88</b>       | <b>780.70</b>     | <b>11.02</b>  | <b>10.03</b>      | <b>9.80</b>   | <b>6.74</b>   | <b>4.47</b>              | <b>8.17</b>          |
| <b>Tukey's HSD<sup>3</sup></b>  | <b>5.95</b>       | <b>1612.80</b>    | <b>22.77</b>  | <b>*20.72</b>     | <b>*20.24</b> | <b>*13.92</b> | <b>9.24</b>              | <b>16.88</b>         |

<sup>1</sup>Percent stand is highlighted for varieties for which treated seed was planted.

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD. For starred HSD values there are no significant differences according to the Tukey test.

*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 <sup>1</sup> |
|---------------------------------|-------------------|-------------------|---------------|-------------------|---------------|---------------|--------------------------|----------------------|
| DE0900705C                      | 76.5 yz           | 3666 j-o          | 85.0 a-d      | 12.0 a-n          | 3.3 lm        | 29 a-d        | 25.6 a-e                 | 93 a-c               |
| GBL 24-04                       | 87.8 g-n          | 3660 k-p          | 75.3 d-k      | 15.5 a-h          | 9.0 d-m       | 24 c-i        | 19.1 j-r                 | 71 h                 |
| DE0900703A                      | 88.3 e-l          | 3616 l-p          | 79.0 b-j      | 8.5 e-o           | 12.5 a-l      | 22 e-i        | 20.5 f-q                 | 94 ab                |
| DE0901101D                      | 88.3 e-l          | 3609 l-p          | 79.8 b-j      | 4.0 d-o           | 16.8 a-g      | 22 f-i        | 18.6 l-r                 | 90 a-e               |
| G200382                         | 78.3 w-           | 3596 l-p          | 72.3 f-k      | 16.3 a-g          | 11.8 b-m      | 25 c-i        | 18.5 m-r                 | 88 a-f               |
| DE0901805B                      | 80.3 r-x          | 3423 m-q          | 73.0 e-k      | 19.3 a-c          | 8.0 e-m       | 24 d-i        | 19.7 i-r                 | 87 a-f               |
| GBL-1000 GS                     | 82.0 r-u          | 3391 n-q          | 82.5 a-h      | 9.3 c-o           | 7.8 e-m       | 27 a-h        | 17.7 o-r                 | 74 gh                |
| G9002033                        | 77.8 x-z          | 3367 n-q          | 84.0 a-e      | 10.3 c-o          | 6.0 i-m       | 20 hi         | 12.9 s                   | 90 a-e               |
| G700801                         | 75.0 z            | 3132 o-q          | 85.5 a-d      | 7.8 f-o           | 6.8 h-m       | 28 a-f        | 17.7 p-r                 | 91 a-e               |
| Meadow                          | 75.3 z            | 3104 o-q          | 78.0 b-j      | 14.5 a-i          | 7.8 e-m       | 21 f-i        | 15.5 rs                  | 85 c-f               |
| DE0901805E                      | 80.0 s-x          | 2882 pq           | 66.5 k        | 21.0 ab           | 12.5 a-l      | 20 i          | 18.6 l-r                 | 91 a-d               |
| DE0901805A                      | 78.3 w-           | 2777 q            | 69.5 jk       | 21.5 a            | 8.8 d-m       | 21 f-i        | 17.3 q-s                 | 93 ab                |
| Cypress                         | 76.8 yz           | 2752 q            | 76.3 c-k      | 19.0 a-d          | 4.8 k-m       | 27 a-h        | 18.8 k-r                 | 72 h                 |
| <i>p-value</i>                  | <b>&lt;0.0001</b> | <b>&lt;0.0001</b> | <b>0.0013</b> | <b>&lt;0.0001</b> | <b>0.0018</b> | <b>0.0185</b> | <b>&lt;0.0001</b>        | <b>&lt;0.0001</b>    |
| <b>Fisher's LSD<sup>2</sup></b> | <b>2.88</b>       | <b>780.70</b>     | <b>11.02</b>  | <b>10.03</b>      | <b>9.80</b>   | <b>6.74</b>   | <b>4.47</b>              | <b>8.17</b>          |
| <b>Tukey's HSD<sup>3</sup></b>  | <b>5.95</b>       | <b>1612.80</b>    | <b>22.77</b>  | <b>*20.72</b>     | <b>*20.24</b> | <b>*13.92</b> | <b>9.24</b>              | <b>16.88</b>         |

<sup>1</sup>Percent stand is highlighted for varieties for which treated seed was planted.

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD. For starred HSD values there are no significant differences according to the Tukey test.

**Table 3. Average Days to Harvest and Standard Deviation of Days to Harvest for the Irrigated Baby Lima Bean Variety Trial Planted June 13, 2013**

| Variety        | Average Days to Harvest | Standard Deviation of Days to Harvest* |
|----------------|-------------------------|--|
| GBL-1000 GS    | 82.0                    | 0.00                                   |
| DE0901201A     | 92.0                    | 0.00                                   |
| DE0901204B     | 95.0                    | 0.00                                   |
| DE0901101D     | 88.3                    | 0.50                                   |
| DE0901502A     | 88.3                    | 0.50                                   |
| DE0901101C     | 88.5                    | 0.58                                   |
| GBL 184-85     | 88.5                    | 1.00                                   |
| DE0900604A     | 91.5                    | 1.00                                   |
| DE0900604B     | 91.5                    | 1.00                                   |
| DE0802702C     | 82.5                    | 1.00                                   |
| DE0901805D     | 83.0                    | 1.15                                   |
| Meadow         | 75.3                    | 1.26                                   |
| DE0802701B     | 76.8                    | 1.26                                   |
| G700801        | 75.0                    | 1.41                                   |
| DE0900603A     | 92.8                    | 1.50                                   |
| DE0802702A     | 82.8                    | 1.50                                   |
| DE0900705C     | 76.5                    | 1.73                                   |
| GBL 24-04      | 87.8                    | 1.89                                   |
| Cypress        | 76.8                    | 1.89                                   |
| DE0901502B     | 89.5                    | 1.91                                   |
| DE0901201B     | 89.0                    | 2.00                                   |
| DE0802102A     | 81.0                    | 2.00                                   |
| DE0802102C     | 78.8                    | 2.22                                   |
| DE0505002A     | 87.3                    | 2.22                                   |
| G200381        | 78.5                    | 2.38                                   |
| DE0901204C     | 87.5                    | 2.38                                   |
| G200382        | 78.3                    | 2.50                                   |
| DE0900701C     | 85.3                    | 2.50                                   |
| DE0901204D     | 86.8                    | 2.63                                   |
| DE0901601B     | 86.3                    | 2.63                                   |
| DE0802102B     | 79.8                    | 2.63                                   |
| DE0407905      | 86.3                    | 2.63                                   |
| GBL 26-04      | 85.0                    | 2.71                                   |
| DE0501801A     | 85.8                    | 2.87                                   |
| DE0901601C     | 86.0                    | 2.94                                   |
| DE0901204A     | 90.5                    | 3.11                                   |
| DE0901206D     | 91.0                    | 3.16                                   |
| GBL 21-04      | 88.0                    | 3.27                                   |
| DE0900703A     | 88.3                    | 3.30                                   |
| DE0901805B     | 80.3                    | 3.30                                   |
| DE0802101A     | 79.3                    | 3.40                                   |
| DE0801802B     | 90.8                    | 3.40                                   |
| DE0900802A     | 85.0                    | 3.46                                   |
| DE0407907      | 86.5                    | 3.51                                   |
| DE0901805E     | 80.0                    | 3.56                                   |
| DE0901805A     | 78.3                    | 3.95                                   |
| DE0900701D     | 85.5                    | 4.12                                   |
| G9002033       | 77.8                    | 4.27                                   |
| DE0900704A     | 81.3                    | 4.27                                   |
| C-elite Select | 88.8                    | 4.57                                   |

**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 and Cotyledon Color from the Irrigated Baby Lima Trial**

| Variety    | Yield (Lbs/A) | Weight of 100 Succulent Seeds (g) | Seedcoat Color | Cotyledon Color |
|------------|---------------|-----------------------------------|----------------|-----------------|
| DE0900603A | 5903 ab       | 81.51 a                           | S              | G               |
| DE0802702C | 4212 f-l      | 80.38 ab                          | M              | W               |
| DE0900604B | 6338 a        | 79.58 ab                          | S              | G               |
| DE0900604A | 5285 bc       | 77.50 a-c                         | S              | G               |
| DE0802101A | 4985 d-f      | 76.91 a-d                         | S              | W               |
| DE0900705C | 3666 j-o      | 75.34 a-e                         | YW             | W               |
| DE0802102C | 4420 d-k      | 75.04 b-e                         | YG             | W               |
| DE0900704A | 4080 i-n      | 73.07 c-f                         | G              | G               |
| DE0802701B | 4064 i-n      | 72.43 c-g                         | YW             | W               |
| DE0802102A | 4745 d-i      | 71.29 d-h                         | WG             | G               |
| DE0900701D | 4864 d-h      | 70.59 e-i                         | YW             | W               |
| DE0900701C | 4101 h-n      | 70.53 e-i                         | LG             | G               |
| DE0802102B | 4914 d-g      | 70.36 e-i                         | G              | G               |
| G200381    | 3688 j-o      | 70.28 e-i                         | G              | G               |
| DE0901601C | 4592 d-i      | 70.20 e-i                         | G              | G               |
| G200382    | 3596 l-p      | 69.91 e-j                         | G              | G               |
| DE0802702A | 4473 d-i      | 69.86 e-j                         | M              | W               |
| GBL-1000   | 3391 n-q      | 69.80 e-j                         | G              | G               |
| DE0900802A | 3688 j-o      | 69.53 e-j                         | G              | G               |
| DE0901601B | 5066 cd       | 67.36 f-k                         | WG             | W               |
| DE0901101C | 4101 h-n      | 66.99 f-l                         | G              | G               |
| G9002033   | 3367 n-q      | 66.91 f-l                         | G              | G               |
| DE0407905  | 4700 d-i      | 66.70 g-l                         | G              | G               |
| Cypress    | 2752 q        | 66.58 g-l                         | G              | G               |
| DE0505002A | 4867 d-h      | 66.12 h-m                         | WG             | LG              |
| DE0407907  | 4497 d-i      | 66.11 h-m                         | G              | G               |
| DE0901201A | 4793 d-i      | 65.94 h-m                         | WG             | W               |
| DE0901204B | 5031 c-e      | 65.39 h-n                         | G              | G               |
| DE0900703A | 3616 l-p      | 64.71 i-o                         | G              | G               |

*(Table 4 continued)*

| Variety                         | Yield (Lbs/A)     | Weight of 100 Succulent Seeds (g) | Seedcoat Color | Cotyledon Color |
|---------------------------------|-------------------|-----------------------------------|----------------|-----------------|
| DE0501801A                      | 4200 g-m          | 64.69 i-o                         | G              | G               |
| DE0901502B                      | 4864 d-h          | 64.47 i-o                         | G              | G               |
| GBL 26-04                       | 4442 d-j          | 63.79 j-p                         | G              | G               |
| C-elite Select                  | 4628 d-i          | 63.26 k-p                         | G              | G               |
| DE0901101D                      | 3609 l-p          | 62.98 k-q                         | G              | G               |
| DE0901805B                      | 3423 m-q          | 61.98 k-r                         | WG             | W               |
| Meadow                          | 3104 o-q          | 61.86 k-r                         | G              | G               |
| DE0801802B                      | 5194 b-d          | 60.88 l-s                         | YW             | W               |
| DE0901805A                      | 2777 q            | 60.36 m-t                         | YW             | W               |
| GBL 21-04                       | 4647 d-i          | 59.95 m-t                         | G              | G               |
| DE0901502A                      | 4231 f-l          | 59.59 n-t                         | G              | G               |
| DE0901805D                      | 4139 g-n          | 59.11 o-t                         | YW             | W               |
| DE0901204D                      | 4625 d-i          | 59.06 o-t                         | WG             | W               |
| DE0901201B                      | 5044 cd           | 59.01 o-t                         | WG             | W               |
| DE0901204A                      | 4744 d-i          | 58.87 o-t                         | WG             | W               |
| DE0901805E                      | 2882 pq           | 58.10 p-t                         | YW             | W               |
| G700801                         | 3132 o-q          | 58.00 p-t                         | G              | G               |
| DE0901204C                      | 4260 e-l          | 56.98 q-t                         | YW             | W               |
| DE0901206D                      | 4640 d-i          | 56.62 r-t                         | WG             | W               |
| GBL 184-85                      | 3677 j-o          | 55.06 st                          | G              | G               |
| GBL 24-04                       | 3660 k-p          | 54.31 t                           | G              | G               |
| <i>p-value</i>                  | <b>&lt;0.0001</b> | <b>&lt;0.0001</b>                 |                |                 |
| <b>Fisher's LSD<sup>2</sup></b> | <b>780.70</b>     | <b>6.109</b>                      |                |                 |
| <b>Tukey's HSD<sup>3</sup></b>  | <b>1612.80</b>    | <b>12.788</b>                     |                |                 |

<sup>1</sup>S=speckled; M=magenta; YW=yellow-white; YG=yellow-green; G=green; WG=white-green; LG=light green; W= white

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD.

## Appendix A: Weather Data for 2012 Baby Lima Variety Trials at Georgetown

May 31<sup>st</sup> (first planting) to September 18<sup>th</sup> (final harvest)

Data from DEOS weather station @ Georgetown, DE-REC: [www.deos.udel.edu](http://www.deos.udel.edu)

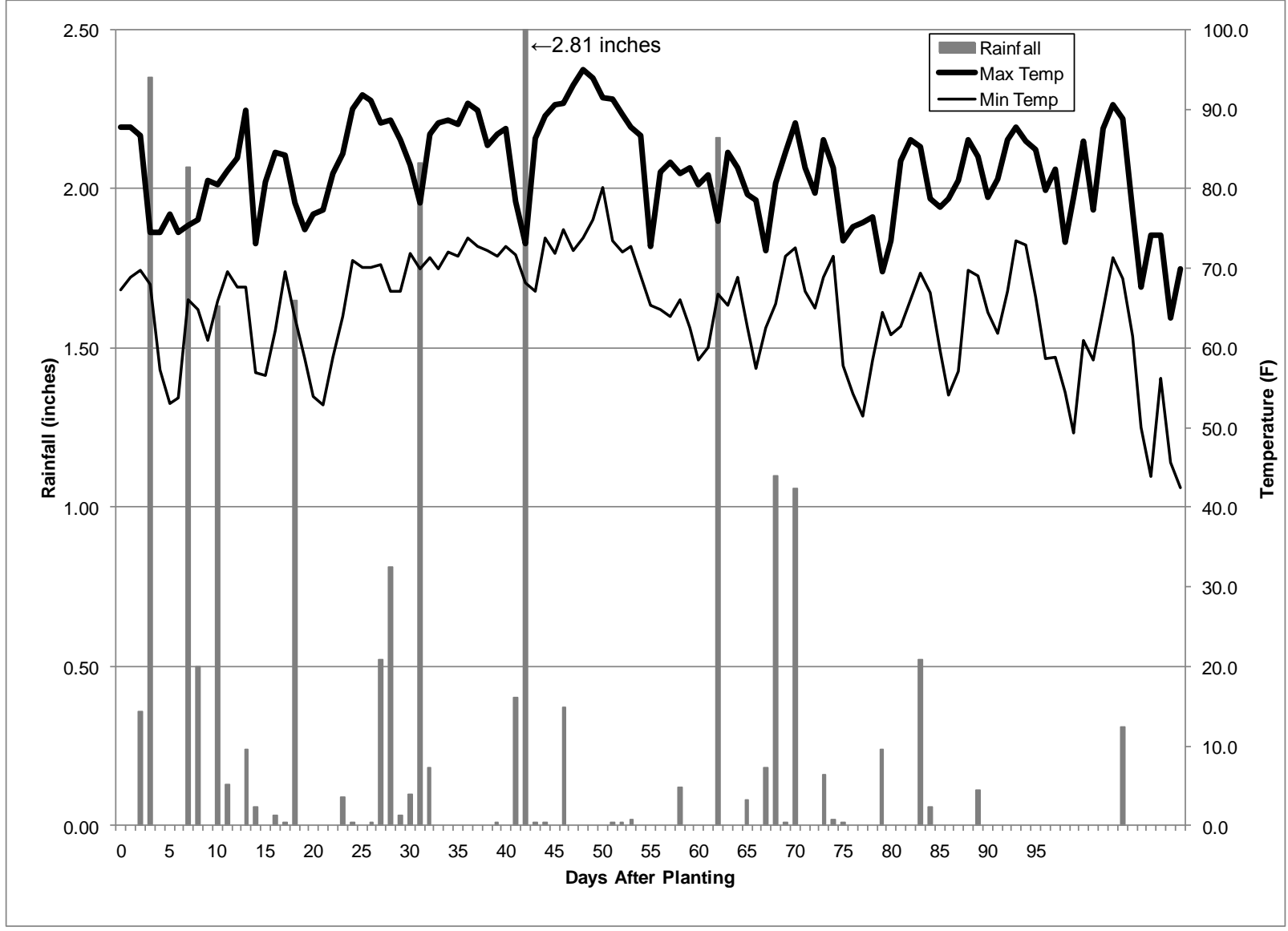
| Days After Planting        |                               | Date   | Max Temp °F | Min Temp °F | Rainfall (in.) |
|----------------------------|-------------------------------|--------|-------------|-------------|----------------|
| May 31<br>Dryland<br>Trial | June 13<br>Irrigated<br>Trial |        |             |             |                |
| 0                          |                               | 31-May | 87.8        | 67.3        | 0              |
| 1                          |                               | 1-Jun  | 87.7        | 68.8        | 0              |
| 2                          |                               | 2-Jun  | 86.6        | 69.7        | 0.36           |
| 3                          |                               | 3-Jun  | 74.5        | 68.0        | 2.35           |
| 4                          |                               | 4-Jun  | 74.6        | 57.3        | 0              |
| 5                          |                               | 5-Jun  | 76.8        | 53.0        | 0              |
| 6                          |                               | 6-Jun  | 74.6        | 53.7        | 0              |
| 7                          |                               | 7-Jun  | 75.4        | 66.1        | 2.07           |
| 8                          |                               | 8-Jun  | 76.1        | 64.8        | 0.5            |
| 9                          |                               | 9-Jun  | 81.1        | 60.9        | 0              |
| 10                         |                               | 10-Jun | 80.6        | 65.9        | 1.63           |
| 11                         |                               | 11-Jun | 82.2        | 69.6        | 0.13           |
| 12                         |                               | 12-Jun | 83.9        | 67.7        | 0              |
| 13                         | 0                             | 13-Jun | 89.9        | 67.7        | 0.24           |
| 14                         | 1                             | 14-Jun | 73.2        | 56.9        | 0.06           |
| 15                         | 2                             | 15-Jun | 80.8        | 56.6        | 0              |
| 16                         | 3                             | 16-Jun | 84.6        | 62.2        | 0.03           |
| 17                         | 4                             | 17-Jun | 84.2        | 69.6        | 0.01           |
| 18                         | 5                             | 18-Jun | 78.3        | 63.7        | 1.65           |
| 19                         | 6                             | 19-Jun | 74.9        | 58.6        | 0              |
| 20                         | 7                             | 20-Jun | 76.8        | 53.9        | 0              |
| 21                         | 8                             | 21-Jun | 77.4        | 52.9        | 0              |
| 22                         | 9                             | 22-Jun | 81.9        | 58.9        | 0              |
| 23                         | 10                            | 23-Jun | 84.4        | 63.9        | 0.09           |
| 24                         | 11                            | 24-Jun | 90.1        | 71.0        | 0.01           |
| 25                         | 12                            | 25-Jun | 91.8        | 70.1        | 0              |
| 26                         | 13                            | 26-Jun | 91.1        | 70.1        | 0.01           |
| 27                         | 14                            | 27-Jun | 88.3        | 70.5        | 0.52           |
| 28                         | 15                            | 28-Jun | 88.6        | 67.2        | 0.81           |
| 29                         | 16                            | 29-Jun | 86.2        | 67.2        | 0.03           |
| 30                         | 17                            | 30-Jun | 82.9        | 71.9        | 0.1            |
| 31                         | 18                            | 1-Jul  | 78.2        | 69.9        | 2.08           |
| 32                         | 19                            | 2-Jul  | 86.8        | 71.3        | 0.18           |
| 33                         | 20                            | 3-Jul  | 88.2        | 70.0        | 0              |
| 34                         | 21                            | 4-Jul  | 88.6        | 72.1        | 0              |
| 35                         | 22                            | 5-Jul  | 88.1        | 71.6        | 0              |
| 36                         | 23                            | 6-Jul  | 90.7        | 73.9        | 0              |
| 37                         | 24                            | 7-Jul  | 89.8        | 72.8        | 0              |
| 38                         | 25                            | 8-Jul  | 85.4        | 72.3        | 0              |
| 39                         | 26                            | 9-Jul  | 86.8        | 71.6        | 0.01           |
| 40                         | 27                            | 10-Jul | 87.6        | 72.8        | 0              |
| 41                         | 28                            | 11-Jul | 78.4        | 71.7        | 0.4            |
| 42                         | 29                            | 12-Jul | 73.1        | 68.1        | 2.81           |
| 43                         | 30                            | 13-Jul | 86.4        | 67.2        | 0.01           |
| 44                         | 31                            | 14-Jul | 89.2        | 73.9        | 0.01           |
| 45                         | 32                            | 15-Jul | 90.5        | 71.9        | 0              |
| 46                         | 33                            | 16-Jul | 90.8        | 74.9        | 0.37           |
| 47                         | 34                            | 17-Jul | 93.0        | 72.2        | 0              |
| 48                         | 35                            | 18-Jul | 94.9        | 73.9        | 0              |
| 49                         | 36                            | 19-Jul | 94.0        | 76.1        | 0              |



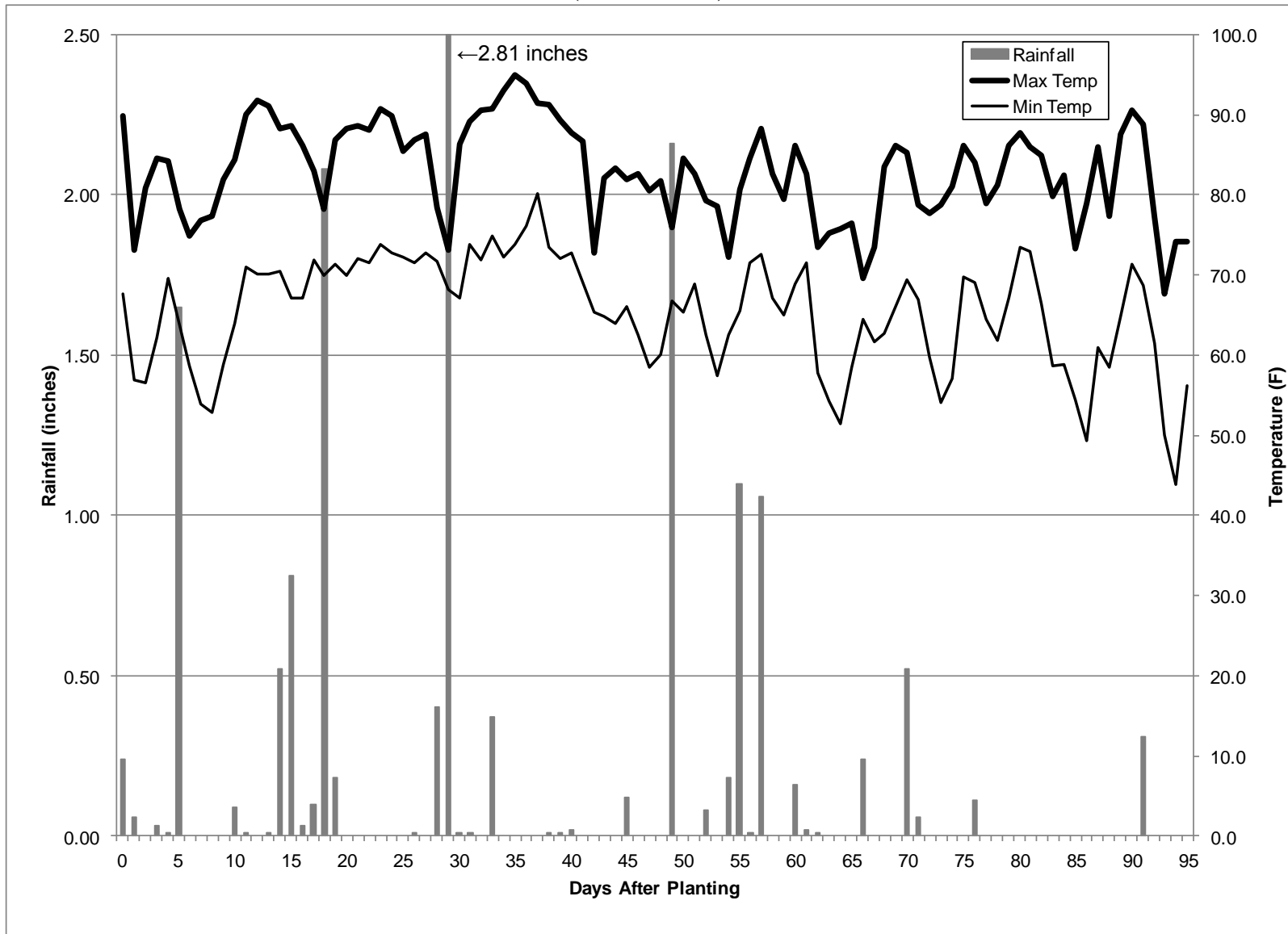
| Days After Planting        |                               | Date   | Max Temp °F | Min Temp °F | Rainfall (in.) |
|----------------------------|-------------------------------|--------|-------------|-------------|----------------|
| May 31<br>Dryland<br>Trial | June 13<br>Irrigated<br>Trial |        |             |             |                |
| 50                         | 37                            | 20-Jul | 91.5        | 80.1        | 0              |
| 51                         | 38                            | 21-Jul | 91.2        | 73.4        | 0.01           |
| 52                         | 39                            | 22-Jul | 89.3        | 72.1        | 0.01           |
| 53                         | 40                            | 23-Jul | 87.8        | 72.8        | 0.02           |
| 54                         | 41                            | 24-Jul | 86.6        | 69.0        | 0              |
| 55                         | 42                            | 25-Jul | 72.8        | 65.3        | 0              |
| 56                         | 43                            | 26-Jul | 82.1        | 64.8        | 0              |
| 57                         | 44                            | 27-Jul | 83.4        | 64.0        | 0              |
| 58                         | 45                            | 28-Jul | 81.9        | 66.1        | 0.12           |
| 59                         | 46                            | 29-Jul | 82.6        | 62.6        | 0              |
| 60                         | 47                            | 30-Jul | 80.6        | 58.4        | 0              |
| 61                         | 48                            | 31-Jul | 81.7        | 60.0        | 0              |
| 62                         | 49                            | 1-Aug  | 76.0        | 66.8        | 2.16           |
| 63                         | 50                            | 2-Aug  | 84.6        | 65.4        | 0              |
| 64                         | 51                            | 3-Aug  | 82.7        | 68.9        | 0              |
| 65                         | 52                            | 4-Aug  | 79.2        | 62.5        | 0.08           |
| 66                         | 53                            | 5-Aug  | 78.6        | 57.5        | 0              |
| 67                         | 54                            | 6-Aug  | 72.3        | 62.6        | 0.18           |
| 68                         | 55                            | 7-Aug  | 80.7        | 65.6        | 1.1            |
| 69                         | 56                            | 8-Aug  | 84.5        | 71.5        | 0.01           |
| 70                         | 57                            | 9-Aug  | 88.3        | 72.5        | 1.06           |
| 71                         | 58                            | 10-Aug | 82.7        | 67.2        | 0              |
| 72                         | 59                            | 11-Aug | 79.4        | 65.0        | 0              |
| 73                         | 60                            | 12-Aug | 86.2        | 68.8        | 0.16           |
| 74                         | 61                            | 13-Aug | 82.6        | 71.6        | 0.02           |
| 75                         | 62                            | 14-Aug | 73.5        | 57.8        | 0.01           |
| 76                         | 63                            | 15-Aug | 75.3        | 54.3        | 0              |
| 77                         | 64                            | 16-Aug | 75.7        | 51.5        | 0              |
| 78                         | 65                            | 17-Aug | 76.5        | 58.5        | 0              |
| 79                         | 66                            | 18-Aug | 69.6        | 64.4        | 0.24           |
| 80                         | 67                            | 19-Aug | 73.4        | 61.7        | 0              |
| 81                         | 68                            | 20-Aug | 83.6        | 62.7        | 0              |
| 82                         | 69                            | 21-Aug | 86.2        | 66.1        | 0              |
| 83                         | 70                            | 22-Aug | 85.3        | 69.4        | 0.52           |
| 84                         | 71                            | 23-Aug | 78.8        | 66.9        | 0.06           |
| 85                         | 72                            | 24-Aug | 77.7        | 59.8        | 0              |
| 86                         | 73                            | 25-Aug | 78.7        | 54.1        | 0              |
| 87                         | 74                            | 26-Aug | 81.1        | 57.0        | 0              |
| 88                         | 75                            | 27-Aug | 86.2        | 69.8        | 0              |
| 89                         | 76                            | 28-Aug | 84.1        | 69.0        | 0.11           |
| 90                         | 77                            | 29-Aug | 79.0        | 64.5        | 0              |
| 91                         | 78                            | 30-Aug | 81.3        | 61.8        | 0              |
| 92                         | 79                            | 31-Aug | 86.2        | 67.1        | 0              |
| 93                         | 80                            | 1-Sep  | 87.8        | 73.5        | 0              |
| 94                         | 81                            | 2-Sep  | 86.0        | 72.9        | 0              |
| 95                         | 82                            | 3-Sep  | 85.0        | 66.4        | 0              |
| 96                         | 83                            | 4-Sep  | 79.8        | 58.6        | 0              |
| 97                         | 84                            | 5-Sep  | 82.5        | 58.8        | 0              |
| 98                         | 85                            | 6-Sep  | 73.3        | 54.5        | 0              |
| 99                         | 86                            | 7-Sep  | 78.9        | 49.4        | 0              |
| 100                        | 87                            | 8-Sep  | 85.9        | 61.0        | 0              |
| 101                        | 88                            | 9-Sep  | 77.4        | 58.5        | 0              |

| Days After Planting        |                               | Date   | Max Temp °F | Min Temp °F | Rainfall (in.) |
|----------------------------|-------------------------------|--------|-------------|-------------|----------------|
| May 31<br>Dryland<br>Trial | June 13<br>Irrigated<br>Trial |        |             |             |                |
| 102                        | 89                            | 10-Sep | 87.5        | 64.9        | 0              |
| 103                        | 90                            | 11-Sep | 90.6        | 71.3        | 0              |
| 104                        | 91                            | 12-Sep | 88.8        | 68.7        | 0.31           |
| 105                        | 92                            | 13-Sep | 77.1        | 61.4        | 0              |
| 106                        | 93                            | 14-Sep | 67.7        | 50.1        | 0              |
| 107                        | 94                            | 15-Sep | 74.2        | 43.9        | 0              |
| 108                        | 95                            | 16-Sep | 74.2        | 56.2        | 0              |
| 109                        |                               | 17-Sep | 63.8        | 45.7        | 0              |
| 110                        |                               | 18-Sep | 69.9        | 42.5        | 0              |

**Appendix B: Weather Conditions During the 2013 Dryland Baby Lima Variety Trial May 31<sup>st</sup> (planting) to September 18<sup>th</sup> (final harvest)**



**Appendix C: Weather Conditions During the 2013 Irrigated Baby Lima Variety Trial June 13<sup>th</sup> (planting) to September 16<sup>th</sup> (final harvest)**



## 2013 Fordhook Lima Bean Variety Trial

The 2013 Fordhook Lima Bean Variety Trial included a total of 17 lines. Fourteen 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. Sussex is a green-seeded ADM variety trialed in Delaware in the past. 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 2013 Delaware Fordhook Lima Bean Variety Trial

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

#### ***Location:***

Field 11-B at the University of Delaware Research and Education Center Farm, Georgetown, DE

#### ***Cultural Practices:***

The trial was hand planted on June 26, 2013 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 1.3 pt/A Dual II Magnum for weed control as well as 40 lbs/A nitrogen in the form of 30% UAN was made after planting. Plots were cultivated three times. One sidedress application of 40 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. 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 October 1 (97 DAP) and ended on October 8 (104 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.

### **Results and Discussion**

Seedling emergence in this trial was variable. Varieties with poor stands tended to have lower yields in the trial (Table 5). While some of the variability in final stand may have resulted from differences in seed age and quality, there could also be genetic factors inherent to the variety at play. DE0701301A, DE0803801A and DE0700904 had at least 90% stands at harvest in both 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 very high. The highest yielding variety in the trial, DE0701101 produced a yield of 6950 lbs/A. Fordhook 242 was the second highest yielding variety in the trial at 6526 lbs/A. None of the varieties produced a significantly higher yield than FH 242, but five UD lines produced a significantly higher yield than Concentrated FH: DE0701101, DE0600602B, DE0701301A, DE0804404C, and DE0600605C. Of these lines DE0701301A and DE0804404C had acceptable seed quality ratings for color, shape and size by 100% of quality evaluators in 2012 (Table 6).

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

**DE0600605C** has had consistently high yields in the four years it has been trialed. The four year average yield for this line is 4854 lbs/A, or 172% 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. 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 four years it has been trialed. The four year average yield for this line is 4273 lbs/A, or 151% 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, but had slightly better acceptability than DE0600605C. 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 three years and has performed well. The three year average yield for this line is 3907 lbs/A, or 152% of the yield of Concentrated Fordhook for those same years. Yield is not as high or as stable as the DE0600605C, but DE0701301A has commercial quality green seed and was rated acceptable by all of the 2012 evaluators. It also had excellent emergence and final stand in the 2012 and 2013 trials.

**DE0804404C** has been tested for two years and has performed well in both years. The two year average yield for this line is 4811 lbs/A, or 140% of the yield of Concentrated Fordhook for those same years. Yield is not as high or as stable as the DE0600605C, but DE0804404C has commercial quality green seed and was rated acceptable by all of the 2012 evaluators. It had poor stand and emergence in the two years it has been trialed, which may be a problem for this line.

**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 2013 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 <sup>1</sup> |
|---------------------------------|-----------------|---------------|-------------|-------------|------------|--------------|-------------------------|----------------------|
| DE0701101                       | 101.0 a         | 6950 a        | 91.8 a      | 4.3 c       | 4.0 a      | 19.3 a       | 12.1 b                  | 81.7 abc             |
| FH 242                          | 99.0 a          | 6526 ab       | 84.5 abc    | 12.9 bc     | 2.6 a      | 18.6 a       | 15.5 a                  | 95.0 a               |
| DE0600602B                      | 99.0 a          | 6395 ab       | 78.9 bcdef  | 11.0 bc     | 10.1 a     | 16.0 a       | 10.7 bc                 | 81.7 abc             |
| DE0701301A                      | 101.0 a         | 6387 ab       | 77.9 bcdef  | 10.2 bc     | 11.9 a     | 17.6 a       | 11.9 bc                 | 90.0 ab              |
| DE0804404C                      | 102.0 a         | 5937 abc      | 82.8 abcd   | 3.7 c       | 13.4 a     | 23.7 a       | 3.6 e                   | 30.0 e               |
| DE0600605C                      | 99.0 a          | 5874 abcd     | 81.8 abcde  | 12.5 bc     | 5.7 a      | 17.2 a       | 10.7 bc                 | 65.0 d               |
| Sussex                          | 101.0 a         | 5824 abcde    | 77.5 bcdef  | 8.8 bc      | 13.7 a     | 13.8 a       | 9.9 bc                  | 83.3 abc             |
| DE0803801A                      | 98.0 a          | 5793 abcde    | 80.9 abcdef | 12.2 bc     | 6.9 a      | 16.4 a       | 10.2 bc                 | 90.0 ab              |
| DE0803801B                      | 98.0 a          | 5721 abcdef   | 69.0 ef     | 13.3 bc     | 17.7 a     | 20.5 a       | 10.5 bc                 | 85.0 ab              |
| DE0700904                       | 101.0 a         | 5088 bcdef    | 79.9 abcdef | 9.6 bc      | 10.5 a     | 15.9 a       | 11.2 bc                 | 91.7 a               |
| DE0900302A                      | 100.3 a         | 5035 bcdef    | 72.5 cdef   | 19.3 ab     | 8.2 a      | 18.2 a       | 10.4 bc                 | 65.0 d               |
| DE0803801C                      | 100.0 a         | 4777 cdef     | 87.5 ab     | 4.1 c       | 8.4 a      | 18.7 a       | 6.7 d                   | 61.7 d               |
| DE0804404A                      | 101.3 a         | 4744 cdef     | 80.2 abcdef | 17.4 ab     | 2.4 a      | 20.8 a       | 4.1 e                   | 28.3 e               |
| DE0701303B                      | 103.3 a         | 4571 cdef     | 68.2 f      | 18.6 ab     | 13.2 a     | 12.9 a       | 10.3 bc                 | 81.7 abc             |
| DE0804101A                      | 98.0 a          | 4434 def      | 78.6 bcdef  | 11.2 bc     | 10.2 a     | 15.4 a       | 9.4 c                   | 83.3 abc             |
| Concentrated FH                 | 101.0 a         | 4336 ef       | 77.1 bcdef  | 12.2 bc     | 10.7 a     | 15.0 a       | 10.0 bc                 | 68.3 cd              |
| DE0804401C                      | 98.7 a          | 4300 f        | 70.0 def    | 25.2 a      | 4.7 a      | 14.9 a       | 10.7 bc                 | 75.0 bcd             |
| <i>p-value</i>                  | 0.4876          | 0.0084        | 0.0457      | 0.0215      | 0.0691     | 0.0726       | <0.0001                 | <0.0001              |
| <b>Fisher's LSD<sup>2</sup></b> | NS              | 1492.3        | 12.851      | 10.746      | NS         | NS           | 2.5554                  | 15.725               |
| <b>Tukey's HSD<sup>3</sup></b>  | NS              | *2745.2       | *23.641     | 19.767      | NS         | NS           | 4.701                   | 28.928               |

<sup>1</sup>Percent stand is highlighted for varieties for which treated seed was planted.

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD. For starred HSD values there are no significant differences according to the Tukey test.



**Table 6. Days to Harvest, Yield, 100 Seed Weight, % Acceptability from 2012 Evaluation and Quality Defects from 2012 Evaluation for Entries in the 2013 Fordhook Lima Bean Variety Trial**

| Variety                         | Days to Harvest | Yield (lbs/A)  | 100 Seed Wt (g)   | % of Evaluators Rating as Acceptable <sup>1</sup> | Quality Defects <sup>1</sup> |
|---------------------------------|-----------------|----------------|-------------------|---|------------------------------|
| DE0701101                       | 101.0 a         | 6950 a         | 200.5 cdef        | 0   | shape, color                 |
| FH 242                          | 99.0 a          | 6526 ab        | 220.7 abc         | 12.5  | color                        |
| DE0600602B                      | 99.0 a          | 6395 ab        | 207.3 cde         | 25  | color                        |
| DE0701301A                      | 101.0 a         | 6387 ab        | 233.2 ab          | 100   |                              |
| DE0804404C                      | 102.0 a         | 5937 abc       | 175.3 fghi        | 100   |                              |
| DE0600605C                      | 99.0 a          | 5874 abcd      | 242.6 a           | 12.5  | color                        |
| Sussex                          | 101.0 a         | 5824 abcde     | 220.6 abc         | 100   |                              |
| DE0803801A                      | 98.0 a          | 5793 abcde     | 194.8 cdefgh      | 0   | size, color                  |
| DE0803801B                      | 98.0 a          | 5721 abcdef    | 163.3 i           | 0   | color                        |
| DE0700904                       | 101.0 a         | 5088 bcdef     | 194.0 defgh       | 12.5  | color                        |
| DE0900302A                      | 100.3 a         | 5035 bcdef     | 206.5 cde         |   |                              |
| DE0803801C                      | 100.0 a         | 4777 cdef      | 172.2 ghi         | 0   | size, shape, color           |
| DE0804404A                      | 101.3 a         | 4744 cdef      | 188.4 efghi       | 100   |                              |
| DE0701303B                      | 103.3 a         | 4571 cdef      | 197.7 cdefg       | 87.5  | size, shape                  |
| DE0804101A                      | 98.0 a          | 4434 def       | 169.9 hi          | 100   |                              |
| Concentrated FH                 | 101.0 a         | 4336 ef        | 215.6 bcd         | 37.5  | color                        |
| DE0804401C                      | 98.7 a          | 4300 f         | 191.9 defgh       | 37.5  | color                        |
| <i>p-value</i>                  | <b>0.4876</b>   | <b>0.0084</b>  | <b>&lt;0.0001</b> |   |                              |
| <b>Fisher's LSD<sup>2</sup></b> | <b>NS</b>       | <b>1492.3</b>  | <b>25.887</b>     |   |                              |
| <b>Tukey's HSD<sup>3</sup></b>  | <b>NS</b>       | <b>*2745.2</b> | <b>47.622</b>     |   |                              |

<sup>1</sup>Based on a 2012 evaluation of blanched and frozen samples. For details see the 2012 Lima Bean Variety Trial Results.

<sup>2</sup>Means followed by the same letter are not significantly different according to Fisher's LSD.

<sup>3</sup>Minimum significant difference according to Tukey's HSD. For starred HSD values there are no significant differences according to the Tukey test.

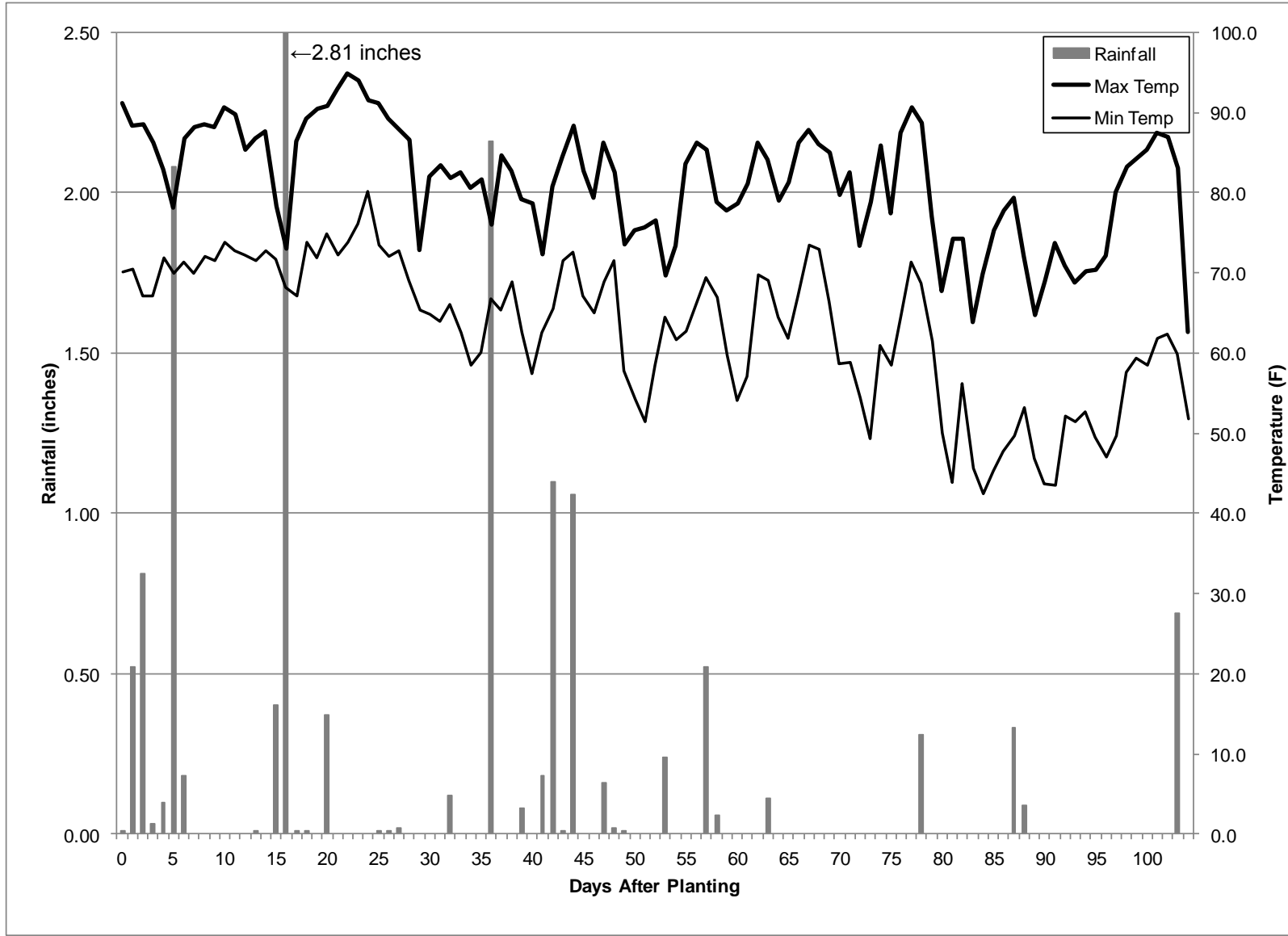
**Appendix E: Weather Data for 2013 Fordhook Lima Variety Trial  
June 26<sup>th</sup> (planting) to October 8<sup>th</sup> (final harvest)**

| <b>DAP</b> | <b>Date</b> | <b>Max Temp<br/>°F</b> | <b>Min Temp<br/>°F</b> | <b>Rainfall (in.)</b> |
|------------|-------------|------------------------|------------------------|-----------------------|
| 0          | 26-Jun      | 91.1                   | 70.1                   | 0.01                  |
| 1          | 27-Jun      | 88.3                   | 70.5                   | 0.52                  |
| 2          | 28-Jun      | 88.6                   | 67.2                   | 0.81                  |
| 3          | 29-Jun      | 86.2                   | 67.2                   | 0.03                  |
| 4          | 30-Jun      | 82.9                   | 71.9                   | 0.1                   |
| 5          | 1-Jul       | 78.2                   | 69.9                   | 2.08                  |
| 6          | 2-Jul       | 86.8                   | 71.3                   | 0.18                  |
| 7          | 3-Jul       | 88.2                   | 70.0                   | 0                     |
| 8          | 4-Jul       | 88.6                   | 72.1                   | 0                     |
| 9          | 5-Jul       | 88.1                   | 71.6                   | 0                     |
| 10         | 6-Jul       | 90.7                   | 73.9                   | 0                     |
| 11         | 7-Jul       | 89.8                   | 72.8                   | 0                     |
| 12         | 8-Jul       | 85.4                   | 72.3                   | 0                     |
| 13         | 9-Jul       | 86.8                   | 71.6                   | 0.01                  |
| 14         | 10-Jul      | 87.6                   | 72.8                   | 0                     |
| 15         | 11-Jul      | 78.4                   | 71.7                   | 0.4                   |
| 16         | 12-Jul      | 73.1                   | 68.1                   | 2.81                  |
| 17         | 13-Jul      | 86.4                   | 67.2                   | 0.01                  |
| 18         | 14-Jul      | 89.2                   | 73.9                   | 0.01                  |
| 19         | 15-Jul      | 90.5                   | 71.9                   | 0                     |
| 20         | 16-Jul      | 90.8                   | 74.9                   | 0.37                  |
| 21         | 17-Jul      | 93.0                   | 72.2                   | 0                     |
| 22         | 18-Jul      | 94.9                   | 73.9                   | 0                     |
| 23         | 19-Jul      | 94.0                   | 76.1                   | 0                     |
| 24         | 20-Jul      | 91.5                   | 80.1                   | 0                     |
| 25         | 21-Jul      | 91.2                   | 73.4                   | 0.01                  |
| 26         | 22-Jul      | 89.3                   | 72.1                   | 0.01                  |
| 27         | 23-Jul      | 87.8                   | 72.8                   | 0.02                  |
| 28         | 24-Jul      | 86.6                   | 69.0                   | 0                     |
| 29         | 25-Jul      | 72.8                   | 65.3                   | 0                     |
| 30         | 26-Jul      | 82.1                   | 64.8                   | 0                     |
| 31         | 27-Jul      | 83.4                   | 64.0                   | 0                     |
| 32         | 28-Jul      | 81.9                   | 66.1                   | 0.12                  |
| 33         | 29-Jul      | 82.6                   | 62.6                   | 0                     |
| 34         | 30-Jul      | 80.6                   | 58.4                   | 0                     |
| 35         | 31-Jul      | 81.7                   | 60.0                   | 0                     |
| 36         | 1-Aug       | 76.0                   | 66.8                   | 2.16                  |
| 37         | 2-Aug       | 84.6                   | 65.4                   | 0                     |
| 38         | 3-Aug       | 82.7                   | 68.9                   | 0                     |
| 39         | 4-Aug       | 79.2                   | 62.5                   | 0.08                  |
| 40         | 5-Aug       | 78.6                   | 57.5                   | 0                     |
| 41         | 6-Aug       | 72.3                   | 62.6                   | 0.18                  |
| 42         | 7-Aug       | 80.7                   | 65.6                   | 1.1                   |
| 43         | 8-Aug       | 84.5                   | 71.5                   | 0.01                  |
| 44         | 9-Aug       | 88.3                   | 72.5                   | 1.06                  |
| 45         | 10-Aug      | 82.7                   | 67.2                   | 0                     |
| 46         | 11-Aug      | 79.4                   | 65.0                   | 0                     |
| 47         | 12-Aug      | 86.2                   | 68.8                   | 0.16                  |

| DAP | Date   | Max Temp °F | Min Temp °F | Rainfall (in.) |
|-----|--------|-------------|-------------|----------------|
| 48  | 13-Aug | 82.6        | 71.6        | 0.02           |
| 49  | 14-Aug | 73.5        | 57.8        | 0.01           |
| 50  | 15-Aug | 75.3        | 54.3        | 0              |
| 51  | 16-Aug | 75.7        | 51.5        | 0              |
| 52  | 17-Aug | 76.5        | 58.5        | 0              |
| 53  | 18-Aug | 69.6        | 64.4        | 0.24           |
| 54  | 19-Aug | 73.4        | 61.7        | 0              |
| 55  | 20-Aug | 83.6        | 62.7        | 0              |
| 56  | 21-Aug | 86.2        | 66.1        | 0              |
| 57  | 22-Aug | 85.3        | 69.4        | 0.52           |
| 58  | 23-Aug | 78.8        | 66.9        | 0.06           |
| 59  | 24-Aug | 77.7        | 59.8        | 0              |
| 60  | 25-Aug | 78.7        | 54.1        | 0              |
| 61  | 26-Aug | 81.1        | 57.0        | 0              |
| 62  | 27-Aug | 86.2        | 69.8        | 0              |
| 63  | 28-Aug | 84.1        | 69.0        | 0.11           |
| 64  | 29-Aug | 79.0        | 64.5        | 0              |
| 65  | 30-Aug | 81.3        | 61.8        | 0              |
| 66  | 31-Aug | 86.2        | 67.1        | 0              |
| 67  | 1-Sep  | 87.8        | 73.5        | 0              |
| 68  | 2-Sep  | 86.0        | 72.9        | 0              |
| 69  | 3-Sep  | 85.0        | 66.4        | 0              |
| 70  | 4-Sep  | 79.8        | 58.6        | 0              |
| 71  | 5-Sep  | 82.5        | 58.8        | 0              |
| 72  | 6-Sep  | 73.3        | 54.5        | 0              |
| 73  | 7-Sep  | 78.9        | 49.4        | 0              |
| 74  | 8-Sep  | 85.9        | 61.0        | 0              |
| 75  | 9-Sep  | 77.4        | 58.5        | 0              |
| 76  | 10-Sep | 87.5        | 64.9        | 0              |
| 77  | 11-Sep | 90.6        | 71.3        | 0              |
| 78  | 12-Sep | 88.8        | 68.7        | 0.31           |
| 79  | 13-Sep | 77.1        | 61.4        | 0              |
| 80  | 14-Sep | 67.7        | 50.1        | 0              |
| 81  | 15-Sep | 74.2        | 43.9        | 0              |
| 82  | 16-Sep | 74.2        | 56.2        | 0              |
| 83  | 17-Sep | 63.8        | 45.7        | 0              |
| 84  | 18-Sep | 69.9        | 42.5        | 0              |
| 85  | 19-Sep | 75.4        | 45.3        | 0              |
| 86  | 20-Sep | 77.8        | 47.7        | 0              |
| 87  | 21-Sep | 79.3        | 49.6        | 0.33           |
| 88  | 22-Sep | 72.1        | 53.2        | 0.09           |
| 89  | 23-Sep | 64.8        | 46.9        | 0              |
| 90  | 24-Sep | 68.9        | 43.6        | 0              |
| 91  | 25-Sep | 73.8        | 43.5        | 0              |
| 92  | 26-Sep | 70.9        | 52.1        | 0              |
| 93  | 27-Sep | 68.8        | 51.4        | 0              |
| 94  | 28-Sep | 70.2        | 52.7        | 0              |
| 95  | 29-Sep | 70.3        | 49.5        | 0              |
| 96  | 30-Sep | 72.2        | 47.1        | 0              |
| 97  | 1-Oct  | 80.1        | 49.6        | 0              |
| 98  | 2-Oct  | 83.3        | 57.6        | 0              |
| 99  | 3-Oct  | 84.3        | 59.4        | 0              |

| <b>DAP</b> | <b>Date</b>  | <b>Max Temp<br/>°F</b> | <b>Min Temp<br/>°F</b> | <b>Rainfall (in.)</b> |
|------------|--------------|------------------------|------------------------|-----------------------|
| <b>100</b> | <b>4-Oct</b> | 85.3                   | 58.4                   | 0                     |
| <b>101</b> | <b>5-Oct</b> | 87.4                   | 61.8                   | 0                     |
| <b>102</b> | <b>6-Oct</b> | 86.9                   | 62.3                   | 0                     |
| <b>103</b> | <b>7-Oct</b> | 83.0                   | 59.9                   | 0.69                  |
| <b>104</b> | <b>8-Oct</b> | 62.6                   | 51.7                   | 0                     |

**Appendix F: Weather Conditions During 2013 Fordhook Variety Trial June 26<sup>th</sup> (planting) to October 8<sup>th</sup> (final harvest)**



## **Acknowledgements**

The authors gratefully acknowledge:

Extension Vegetable Program employees: Heather Baker, Danielle Vanderhei, Melissa Bryfogle, Matthew Chaffinch, Caleb Yatuzis and Jake Jones who helped to plant, maintain and harvest the plots.

Participating seed companies: ADM-Seedwest and Ben Fish

Justin Prystajko from Hanover Foods and Kenny Gauen and Cory Atkins from The Pictsweet Company for providing seed for standard varieties and border rows.

James Adkins, who maintains the viner.

Brian Hearn and the REC Farm Crew for help with field operations.