



Niche Market Dry Bean Variety Trial

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Dry beans are generally considered a large-scale bulk commodity crop yet they are also well suited to small-scale production for niche markets. Heirloom varieties may be particularly well suited to niche markets. Dry beans are harvested in the fall, are easily stored over the winter, and can be a good addition for direct market farmers who need additional crops at the beginning and end of the growing season. A primary criterion for variety suitability in the maritime Pacific Northwest is early maturity. Cool summer temperatures in the region result in a low number of growing degree days (1900 GDD in Vancouver) and most varieties are harvested 15 or more days later than in the mid-west. A primary objective for evaluating dry beans in Vancouver was to determine which varieties are suitable for production in the Pacific Northwest.

Materials and Methods

The experiment had a randomized complete block design with four replications and included 53 entries in 2001, 64 entries in 2002 and 116 entries in 2003 (Table 1). In all 3 years, plots were 2 rows wide and 10 feet long, spacing between rows was 2 feet, and spacing in the row was 2 inches. In 2002 we included 28 plant introductions (PI lines) in single row plots. We harvested seeds from 26 of these (2 did not reach maturity) and planted them in replicated plots in 2003. A few runner varieties were included in 2001 and 2002, however they were not staked or trellised.

The field was prepared in May and dry beans were planted on June 6 2001, May 23 2002 and May 20 2003. In all three years, plots were mechanically cultivated once a week to control weeds between rows, and hand weeded to control in-row weeds as needed from July through August. Overhead irrigation was applied to the field on a weekly basis or as needed.

In 2001, feather meal fertilizer (12-0-0) was applied in a side-dress application on July 5 at a rate of 375 lb/A (45 lb N/A). In 2002, an organic granular fertilizer 9-3-7 was applied at the rate of 200 lb/A (18 lb N/A) on June 12 in a side-dress application. In August, iron and manganese deficiency symptoms were observed in the field and an organic foliar spray was applied in the third week of August to supply each at the rate of 3 lbs per acre. In October 2002 we planted the field to a cereal rye cover crop at the rate of 120 lb/A. The cover crop was plowed down on April 28, 2003 and Calpril was applied to the soil at the rate of 1000 lb/A in 2003 to supply Calcium. An organic fertilizer 9-3-7 was applied at the rate of 400 lb/A (36 lb N/A) in a side-dress application on July 10. Also on July 10, crimson clover cover crop seed was broadcast throughout the field and incorporated into the soil.

Days after planting (DAP) to emergence, first flower, and harvest were measured. Plant stand was measured in 10 feet of row. Plant height (cm) was measured for 10 randomly selected plants in the center of each plot. Plants were harvested fr□

plants were harvested from the center 5 feet of row. Whole plants were harvested, placed in burlap bags, and dried in field ovens for 16 hours at 68° C, until seed moisture was approximately 12%. Ten pods were randomly selected and pod length and number of beans per pod were measured. Beans were threshed and cleaned by hand in 2001 and 2002, and in 2003 threshing was done by machine and cleaning by hand. In 2003, we fabricated a small-scale mechanical bean thresher for this work. Total marketable bean yield (g) was measured. 100 beans were randomly selected and weighed, and length and width (cm) of 25 beans were measured.

Results and Discussion

Beans emerged on average for all three years 9–6 DAP (Table 2), flowering began on 37 DAP, while harvest began 114 DAP and ended 135 DAP. Rains prevented harvest from continuing beyond early October in all 3 years. Varieties that did

not mature in 2001 were Candy, Celina's Romano and California Black Eye 46 (*Vigna unguiculata*). In 2002, Kentucky Wonder and Scarlet Emperor did not mature, and California Black Eye, PR95-055-2-1-16 and UI 228 had very poor plant stands and were not harvested. In 2003, PR95-055-2-1-16, W 614738, Appaloosa, Snowcap and Steuben Yellow Eye did not germinate.

Plant stand was measured mid-season and varied significantly among varieties (Table 3). Mean plant stand for all three years was 46 plants per 10-feet row. Plant height was measured in August in 2001, in July in 2002 and 2003, and at harvest in all 3 years. Plant height varied significantly among varieties and years. Mean mid-season plant height in 2001 was 27 cm (10.6 in), 44.3 cm (17.4 in) in 2002 and 36 cm (14.2 in) in 2003. Mean plant height at harvest in 2001 was 25 cm (9.8 in), 37 cm (14.6 in) in 2002 and 27.6 cm (10.6 in) in 2003. Plant height declined at harvest as compared to mid-season due to the weight of mature pods that cause plants to bend slightly.

Mean yield for 10-feet row for all three years was 498 g (1.1 lb), and the range was 446–549 g (1.0–1.2 lb). Yield differed significantly among varieties in all 3 years. Varieties that yielded greater than 600 g per 10-feet row in 2001 were G-18689 (681g, 1.5 lb), NW-63 (655 g, 1.4 g), and Etna (640 g, 1.4 lb). In 2002, varieties that yielded more than 700 g per 10-feet row were Montcalm (786 g, 1.7 lb), G-18689 (756 g 1.66 lb), and Magpie (746.4 g, 1.6 lb). In 2003, G-18689 (999 g, 2.2 lb), H-9673-87 (962 g, 1.9 lb), and W-614724 (928 g, 2.0 lb) yielded more than 900 g per 10-feet row. The three climbing-types of beans, grown in 2002, Scarlet Emperor (156 g, 0.34 lb), Painted Lady (167 g, 0.37 lb), and Kentucky Wonder (197 g, 0.43 lb) were very low yielding as can be expected as they were not trellised. In 2002, Painted Lady (187 g, 0.4 lb), was the second lowest yielding variety and was the only climbing variety that was harvested as the others did not reach maturity. Although it is possible to grow climbing type varieties in untrellised rows their yield is extremely low and their maturity appears to be delayed in this system. In 2003 no climbing types were grown, and French Shell Flambeau (109 g, 0.24 lb) and Erimo (122 g, 0.27 lb) were the lowest yielding entries.

Great Northern tended to be the highest yielding market class (700 g, 1.5 lb per 10 row feet) while Flageolet was one of the lowest yielding (400 g, 0.9 lb). In general, the mean yield of niche market classes (Yellow Eye/Partially Colored, Brown/Yellow, Flageolet, and Other) are all less than mean yield of primary market classes. This indicates that niche market varieties could be improved in regards to yield.

Mean weight of 100 beans for all three years was 46.3 g (0.1 lb) and differed significantly among varieties. Varieties with the greatest 100-bean weight on average all three years were Andrew Kent 67.5 g (0.15 lb), Old Fashioned Soldier 65.7 g (0.14 lb), Trout/Jacob's Cattle 65.6 g (0.14 lb), Etna 64 g (0.14 lb), and Montcalm 63.7 g (0.14 lb). Length and width of 25 beans were measured in order to further characterize bean size. The overall mean length of 25 beans for three years was 31 cm (12.2 in). The overall mean width of 25 beans was 19 cm (7.7 in). CELRK and Andrew Kent varied significantly in bean length in all 3 years. Andrew Kent, Candy, Cannellini, CELRK, Mansel Magic, and Beni Dainagon varied significantly in bean length in two out of three years.

Length of 10 pods and number of beans per pod were also measured. The overall mean pod length for three years was 11 cm (5 in). Pod length of Cardinal, Etna and Trout/Jacob's Cattle, Candy and 5-593 Wild Type varied significantly among years. Number of beans per pod was measured in 2003 only and varied significantly among varieties. Takara and W 614731 had the highest number of beans per pod (6.9) followed by Great Northern White (6.4).

In 2002, virus and Halo Blight (*Pseudomonas syringae*) symptoms were first observed on plant leaves in the field on July 1. Symptoms increased in severity and spread through the field as the season progressed. Leaf samples from all varieties were collected and sent to the WSU disease diagnostic laboratory for pathogen identification. Cannellini, Celina's Romano, Dwayne Baptiste's, Maine Yellow Eye, Nugget, Serene, Speckled Bays and Tongue of Fire were found to be affected by Halo Blight. Orca, Hutterite, Maefax, Beka, Zert, Cannellini, Andrew Kent, Trout/Jacob's Cattle and Speckled Bays were affected by a poty virus. In 2003, Halo Blight symptoms were first observed on plant leaves in the field on June 26 and leaf samples were sent for race identification. The Halo Blight pathogen in the samples were identified as Races 2 and 8, which are very similar and considered to be the same race. 5-593 Wild type, 5-593Cu, Candy, Etna, Kintoki, Maine Yellow Eye, Nugget, Speckled Bays, Thort, Trout/Jacob's Cattle, CO 32977, and Volcano were found to be affected by Halo Blight. On July 29, NuCop 50 DF was applied for Halo Blight control.

Based on our study results, we have developed a web page, <http://SustainableSeedSystems.wsu.edu/NicheMarket/BeanVarieties.pdf>, that describes dry bean varieties with an emphasis on varieties that are suitable for niche markets. This web page is designed to facilitate variety selection by farmers by including a brief description of each variety based on our data and observations, and a color photograph. The color, pattern and size of dry beans play a large role in variety selection for niche markets.

Green Pod Taste Evaluations

In this preliminary study, we harvested green pods of 10 dry bean varieties on August 7 to evaluate their qualities as green beans.

Objectives

- To evaluate the potential of harvesting dry bean varieties as green beans.
- To evaluate quality of given pods, as raw and cooked.
- To begin explore the potential of marketing green beans harvested from a dry bean field for additional income for small-scale farmers.

Materials and Methods

We evaluated a very small number of varieties in this preliminary study. In August, we harvested green pods from 10 entries. In each plot, we harvested 10 pods and we measured total pod weight (g), length (cm), and width (cm). We tasted pods raw and lightly steamed for general flavor and stringiness.

Results and Discussion

Great Northern White had the great yield (47.6 g) and Midnight Black Turtle had the lowest yield (27.3 g). Magpie had the longest pods (120.5 cm, 47.4 in), Midnight Black Turtle had the shortest pods (79 cm, 31.1 in), and Brown Dutch had the widest pods (13.3 cm, 5.2 in). G-18689, Magpie and W 614731 were not stringy while all other entries were stringy. Non-stringy entries plus Navy Pea had good flavor as raw green beans. ICB-10, Magpie and W 614731 had very good flavor as cooked beans (Table 8). W61423 was the only entry that had good green bean flavor both raw and cooked.

Table 1. Bean varieties, and their sources, planted at WSU Vancouver REU in 2001, 2002 and 2003.

| <u>Variety</u> | <u>Seed Source</u> | <u>Variety</u> | <u>Seed Source</u> |
|-----------------------------|------------------------|-----------------------|--------------------|
| 5-593 Wild type | Jim Myers, OSU | Lake Kivu | Salt Spring Seeds |
| 5-593Cu | Jim Myers, OSU | Le Baron | USDA-ARS Prosser |
| 5-593p gri | Jim Myers, OSU | Maefax | Salt Spring Seeds |
| 95:8186C | USDA-ARS Prosser | Magpie | Salt Spring Seeds |
| Amish Knuttle | Vermont | Maine Yellow Eye | Johnny's |
| Andrew Kent | Johnny's | Major | Territorial |
| Appaloosa | Vermont | Mansel Magic | Salt Spring Seeds |
| Arthur | USDA-ARS Prosser | Midnight Black Turtle | Johnny's |
| Beka | Salt Spring Seeds | Molasses Face | Salt Spring Seeds |
| BelNeb-RR-1 | WSU Prosser | Montcalm | Territorial |
| Beni Dainagon <i>adzuki</i> | WSU Prosser | Montezuma Red | Nichols |
| Black Coco | Johnny's & Territorial | Mrocumiere | Salt Spring Seeds |
| Brown Dutch | Vermont | Navy Pea | Vermont |
| Burke | USDA-ARS Prosser | Norstar | USDA-ARS Prosser |
| Calypso | Vermont | Norwegian | Salt Spring Seeds |
| Candy | Salt Spring Seeds | Nugget | Territorial |
| Cannellini | Territorial | NW-63 | USDA-ARS Prosser |
| Cardinal | USDA-ARS Prosser | Old Fashioned Soldier | Johnny's |
| CELRK | USDA-ARS Prosser | Orca (USWA-27) | USDA-ARS Prosser |
| Childer's Golden | Salt Spring Seeds | Othello | USDA-ARS Prosser |
| CO 32948 | Jim Myers, OSU | Peregrin | Vermont |
| CO 32977 | Jim Myers, OSU | PL 353479 | USDA-WRPIS |
| CO 40696 | Jim Myers, OSU | PL 549794 | USDA-WRPIS |
| Dwane Baptiste's | Salt Spring Seeds | PI 549776 | USDA-WRPIS |
| Erimo <i>adzuki</i> | WSU Prosser | Pinks | Salt Spring Seeds |
| Etna | Territorial | Pinto | Vermont |
| French Flageolet | Nichols | PR95-055-2-1-16 | USDA-ARS Prosser |
| French Shell Flambeau | Johnny's | Red Kidney | Vermont |
| G18689 | USDA-ARS Prosser | Red Mexican | Vermont |
| Great Northern White | Vermont | Red Soldier | WSU Prosser |
| H9659-37-2 | USDA-ARS Prosser | Royal Burgundy | Territorial |
| H9673-87 | USDA-ARS Prosser | Serene | Salt Spring Seeds |
| Hutterite | Salt Spring Seeds | Snow Cap | Vermont |
| ICB-10-5 | USDA-ARS Prosser | Soldier | Vermont |
| ICB-10-5-14 | USDA-ARS Prosser | Speckled Bays | Territorial |
| Ireland Creek | Salt Spring Seeds | Stevenson Blue Eve | Vermont |
| Kardinal | USDA-ARS Prosser | Stevenson Blue Eve | Salt Spring Seeds |
| Kintoki | Salt Spring Seeds | Swedish Brown | Vermont |

| <u>Variety</u> | <u>Seed Source</u> |
|------------------------------|--------------------|
| Takara <i>adzuki</i> | WSU Prosser |
| Taylor's | Osborne |
| Thort | USDA-ARS |
| Tongue of Fire | Salt Spring Seeds |
| Trout/Jacob's Cattle | Johnny's |
| UI-239 | USDA-ARS Prosser |
| UI-537 | USDA-ARS Prosser |
| UI-911 | USDA-ARS Prosser |
| UI-911 | USDA-ARS Prosser |
| USCR-14 | USDA-ARS Prosser |
| USCR-15 | USDA-ARS Prosser |
| USPT-73 | USDA-ARS Prosser |
| USPT-CBB-1 | USDA-ARS Prosser |
| USRN-20 | USDA-ARS Prosser |
| USWA-33 | USDA-ARS Prosser |
| USWA-39 | USDA-ARS Prosser |
| Vermont Cranberry | Johnny's |
| Volcano | Osborne |
| WAA 2201/Crimson <i>adz.</i> | WSU Prosser |
| W6 14717 | USDA-WRPIS |

| <u>Variety</u> | <u>Seed Source</u> |
|----------------|--------------------|
| W6 14718 | USDA-WRPIS |
| W6 14719 | USDA-WRPIS |
| W6 14720 | USDA-WRPIS |
| W6 14721 | USDA-WRPIS |
| W6 14722 | USDA-WRPIS |
| W6 14723 | USDA-WRPIS |
| W6 14724 | USDA-WRPIS |
| W6 14725 | USDA-WRPIS |
| W6 14726 | USDA-WRPIS |
| W6 14727 | USDA-WRPIS |
| W6 14728 | USDA-WRPIS |
| W6 14729 | USDA-WRPIS |
| W6 14731 | USDA-WRPIS |
| W6 14732 | USDA-WRPIS |
| W6 14733 | USDA-WRPIS |
| W6 14734 | USDA-WRPIS |
| W6 14736 | USDA-WRPIS |
| W6 14737 | USDA-WRPIS |
| W6 14738 | USDA-WRPIS |
| ZERT | Salt Spring Seeds |

Table 2. Days after planting (DAP) to emergence, 1st flower, and harvest of dry bean varieties at WSU Vancouver REU in 2001, 2002 and 2003.

| Type | Emer DAP | | | | 1st Flw DAP | | | | Harv DAP | | | |
|-------------------------------|----------|------|------|------|-------------|------|------|------|----------|-------|-------|-------|
| Variety | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver |
| Dark Red Kidney | 11.0 | 12.0 | 10.2 | 11.1 | 43.7 | 33.1 | 46.5 | 41.1 | 112.2 | 111.5 | 115.1 | 115.7 |
| H9659-37-2 | | | 9 | 9 | | | 51 | 51 | | | 107 | 107 |
| Kintoki | | 12 | 10 | 11 | | 31 | 42 | 37 | | 108 | 100 | 104 |
| Montcalm | 11 | 12 | 10 | 11 | 44 | 35 | 45 | 41 | 112 | 115 | 109 | 112 |
| Red Kidney | | | 11 | 11 | | | 46 | 46 | | | 101 | 101 |
| USWA-39 | | | 10 | 10 | | | 43 | 43 | | | 112 | 112 |
| W 614718 | | | 10 | 10 | | | 48 | 48 | | | 124 | 124 |
| W 614719 | | | 10 | 10 | | | 52 | 52 | | | 122 | 122 |
| W 614722 | | | 9 | 9 | | | 47 | 47 | | | 123 | 123 |
| W 614724 | | | 10 | 10 | | | 43 | 43 | | | 121 | 121 |
| W 614725 | | | 10 | 10 | | | 48 | 48 | | | 124 | 124 |
| W614727 | | | 12 | 12 | | | 46 | 46 | | | 124 | 124 |
| Light Red Kidney | 12.0 | 13.0 | 9.9 | 11.6 | 43.2 | 33.3 | 45.4 | 40.6 | 113.3 | 115.5 | 111.3 | 113.4 |
| CELRK | 13 | 13 | 9 | 12 | 41 | 31 | 42 | 38 | 110 | 115 | 109 | 111 |
| Kardinal | 11 | 13 | 10 | 11 | 46 | 35 | 51 | 44 | 117 | 116 | 104 | 112 |
| USWA-33 | | | 9 | 9 | | | 45 | 45 | | | 106 | 106 |
| W 614733 | | | 9 | 9 | | | 42 | 42 | | | 120 | 120 |
| W 614737 | | | 12 | 12 | | | 48 | 48 | | | 118 | 118 |
| White Kidney | 13.0 | 12.8 | 9.8 | 11.8 | 40.3 | 32.7 | 43.2 | 38.7 | 115.0 | 118.0 | 112.7 | 114.7 |
| Cannellini | 13 | 14 | 10 | 12 | 40 | 33 | 43 | 39 | 115 | 118 | 119 | 117 |
| Dwane Baptiste | | 12 | 10 | 11 | | 33 | 43 | 38 | | 118 | 106 | 112 |
| Great Northern | | | 11 | 11.0 | | | 53 | 52.5 | | | 116 | 116 |
| BelNeb-RR-1 | | | 9 | 9 | | | 50 | 50 | | | 108 | 108 |
| Great Northern White | | | 13 | 13 | | | 55 | 55 | | | 124 | 124 |
| Small White/Navy | 11.5 | 13.5 | 10.1 | 11.7 | 47.8 | 38.8 | 51.0 | 45.9 | 112.0 | 116.5 | 110.1 | 112.1 |
| Arthur | 11 | 13 | 10 | 11 | 46 | 37 | 49 | 44 | 112 | 118 | 113 | 114 |
| Navy Pea | | | 11 | 11 | | | 55 | 55 | | | 111 | 111 |
| Norstar | 12 | 14 | 9 | 12 | 49 | 40 | 50 | 46 | 112 | 115 | 106 | 111 |
| Small Red/ Red Mexican | 13.0 | 13.7 | 10.0 | 12.2 | 42.8 | 33.8 | 48.2 | 41.6 | 112.4 | 110.3 | 109.6 | 111.1 |
| LeBaron | 11 | 13 | 9 | 11 | 43 | 35 | 49 | 42 | 110 | 108 | 100 | 106 |
| Montezuma Red | 15 | 14 | 9 | 13 | 45 | 33 | 43 | 40 | 111 | 110 | 104 | 108 |
| NW-63 | 13 | 14 | 10 | 12 | 41 | 34 | 43 | 39 | 116 | 113 | 105 | 111 |
| Red Mexican | | | 11 | 11 | | | 42 | 42 | | | 101 | 101 |
| USRM-20 | | | 10 | 10 | | | 53 | 53 | | | 104 | 104 |
| W 614720 | | | 10 | 10 | | | 49 | 49 | | | 114 | 114 |
| W 614723 | | | 10 | 10 | | | 49 | 49 | | | 119 | 119 |
| W 614726 | | | 10 | 10 | | | 50 | 50 | | | 109 | 109 |
| W 614728 | | | 9 | 9 | | | 50 | 50 | | | 113 | 113 |
| W 614731 | | | 13 | 13 | | | 55 | 55 | | | 124 | 124 |
| W 614736 | | | 10 | 10 | | | 49 | 49 | | | 113 | 113 |
| Pink | 13.0 | 12.5 | 10.9 | 12.1 | 47.7 | 35.7 | 50.5 | 44.6 | 115.2 | 112.5 | 106.8 | 110.9 |
| UI-537 | 13 | 12 | 12 | 12 | 48 | 36 | 49 | 44 | 115 | 110 | 106 | 110 |
| Pinks | | 13 | 10 | 12 | | 35 | 52 | 44 | | 115 | 108 | 112 |
| Black | 11.3 | 12.4 | 9.5 | 11.1 | 48.1 | 35.0 | 50.6 | 44.5 | 118.1 | 114.3 | 108.1 | 111.1 |
| 5-593 Wild Type | | 12 | 9 | 10 | | 33 | 46 | 39 | | 105 | 99 | 102 |
| Black Coco | 11 | 13 | 10 | 11 | 43 | 32 | 43 | 39 | 118 | 118 | 102 | 113 |
| H9673-87 | | | 9 | 9 | | | 59 | 59 | | | 109 | 109 |

| Type | Emer DAP | | | | 1st Flw DAP | | | | Hary DAP | | | |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|
| Variety | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver |
| Black Coco | 11 | 13 | 10 | 11 | 43 | 32 | 43 | 39 | 118 | 118 | 102 | 113 |
| H9673-87 | | | 9 | 9 | | | 59 | 59 | | | 109 | 109 |
| ICB-10-5 | | | 10 | 10 | | | 60 | 60 | | | 109 | 109 |
| ICB-10-5-14 | 11 | 16 | 9 | 12 | 52 | 39 | 52 | 48 | 118 | 122 | 105 | 115 |
| Major | | 10 | 9 | 10 | | 29 | 44 | 36 | | 105 | 105 | 105 |
| Midnight Black Turtle | 11 | 12 | 9 | 11 | 54 | 43 | 64 | 54 | 118 | 117 | 113 | 116 |
| UL-239 | | | 9 | 9 | | | 47 | 47 | | | 105 | 105 |
| UL-911 | 12 | 12 | 11 | 12 | 44 | 34 | 49 | 42 | 118 | 119 | 113 | 117 |
| W 614721 | | | 11 | 11 | | | 44 | 44 | | | 120 | 120 |
| Cranberry | 11.1 | 12.9 | 9.7 | 10.8 | 43.8 | 33.7 | 44.6 | 43.0 | 115.3 | 115.9 | 108.6 | 112.1 |
| 95-8186C | | | 10 | 10 | | | 45 | 45 | | | 113 | 113 |
| Andrew Kent | | 14 | 11 | 13 | 43 | 34 | 44 | 40 | 120 | 123 | 106 | 116 |
| Candy | | 12 | 10 | 11 | | 39 | 53 | 46 | | 119 | 103 | 111 |
| Cardinal | 11 | 11 | 9 | 10 | 43 | 32 | 43 | 39 | 119 | 117 | 104 | 113 |
| CO 406960 | | | 11 | 11 | | | 47 | 47 | | | 111 | 111 |
| Etna | 10 | 12 | 10 | 11 | 42 | 32 | 44 | 39 | 114 | 112 | 104 | 110 |
| PR95-055-2-1-16 | 13 | 15 | | 14 | 49 | | | 49 | 112 | | | 112 |
| Speckled Bays | 12 | 13 | 10 | 11 | 45 | 35 | 44 | 41 | 116 | 114 | 103 | 111 |
| Taylor's | | | 10 | 10 | | | 43 | 43 | | | 110 | 110 |
| Thort | 11 | 14 | 9 | 11 | 43 | 32 | 42 | 39 | 114 | 113 | 109 | 112 |
| Tongue of Fire | 10 | 12 | 9 | 10 | 42 | 32 | 43 | 39 | 116 | 113 | 109 | 113 |
| USCR-14 | | | 9 | 9 | | | 42 | 42 | | | 103 | 103 |
| USCR-15 | | | 9 | 9 | | | 43 | 43 | | | 118 | 118 |
| Vermont Cranberry | 11 | 14 | 9 | 11 | 42 | 34 | 44 | 40 | 112 | 116 | 109 | 112 |
| Volcano | | | 11 | 11 | | | 45 | 45 | | | 106 | 106 |
| W 614729 | | | 9 | 9 | | | 50 | 50 | | | 124 | 124 |
| Pinto | | 10.1 | 10.1 | | | | 44 | 44 | | | 100.6 | 101 |
| Burke | | | 10 | 10 | | | 45 | 45 | | | 101 | 101 |
| Othello | | | 10 | 10 | | | 43 | 43 | | | 99 | 99 |
| Pinto | | | 11 | 11 | | | 43 | 43 | | | 101 | 101 |
| USPT-73 | | | 10 | 10 | | | 46 | 46 | | | 103 | 103 |
| USPT-CBB-1 | | | 10 | 10 | | | 44 | 44 | | | 100 | 100 |
| <i>Yellow Eye/ Partially Colored</i> | <i>11.0</i> | <i>11.8</i> | <i>10.4</i> | <i>11.1</i> | <i>42.5</i> | <i>37.0</i> | <i>47.4</i> | <i>42.3</i> | <i>113.5</i> | <i>113.5</i> | <i>106.7</i> | <i>110.8</i> |
| Celina's Romano | | 11 | | 11 | | 37 | | 37 | | 114 | | 114 |
| Maine Yellow Eye | 11 | 13 | 10 | 11 | 42 | 33 | 43 | 39 | 114 | 114 | 102 | 110 |
| Molasses Face | | 12 | 10 | 11 | | 38 | 51 | 45 | | 108 | 106 | 107 |
| Old Fashioned Soldier | 11 | 12 | 11 | 11 | 43 | 32 | 44 | 40 | 114 | 113 | 110 | 112 |
| Red Soldier | | 9 | 11 | 10 | | 43 | 45 | 44 | | 113 | 101 | 107 |
| Soldier | | | 11 | 11 | | | 46 | 46 | | | 111 | 111 |
| Stevenson Blue Eye | | 14 | 10 | 12 | | 39 | 56 | 47 | | 119 | 110 | 114 |
| Brown or Yellow Beans | 12.5 | 10.1 | 11.3 | | 31.9 | 42.8 | 37.3 | | 111.9 | 106.1 | 108.6 | |
| Beka | | 12 | 9 | 11 | | 32 | 42 | 37 | | 112 | 99 | 106 |
| Brown Dutch | | | 11 | 11 | | | 46 | 46 | | | 111 | 111 |
| Childer's Golden | | 16 | 9 | 13 | | 33 | 42 | 38 | | 114 | 116 | 115 |
| Hutterite | | 15 | 10 | 12 | | 33 | 42 | 38 | | 117 | 109 | 113 |
| Ireland Creek | | 12 | 10 | 11 | | 32 | 43 | 38 | | 112 | 99 | 106 |
| Lake Kivu | | 11 | 9 | 10 | | 31 | 41 | 36 | | 111 | 109 | 110 |
| Maefax | | 11 | 9 | 10 | | 32 | 42 | 37 | | 109 | 98 | 103 |

| Type | Emer DAP | | | | 1st Flw DAP | | | | Hary DAP | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|
| Variety | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver | 01 | 02 | 03 | Aver |
| Norwegian | | 11 | 9 | 10 | | 32 | 42 | 37 | | 108 | 99 | 103 |
| PI 353479 | | | 10 | 10 | | | 42 | 42 | | | 103 | 103 |
| PI 549776 | | | 10 | 10 | | | 43 | 43 | | | 100 | 100 |
| Swedish Brown | | | 13 | 13 | | | 46 | 46 | | | 124 | 124 |
| Zert | | 12 | 11 | 11 | | 31 | 43 | 37 | | 112 | 107 | 110 |
| Flageolet | 13.0 | 9.1 | 11.1 | 11.1 | 50.5 | 34.8 | 44.8 | 43.4 | 114.5 | 122.0 | 116.8 | 118.7 |
| French Flageolet | | 12 | 9 | 11 | 51 | 35 | 47 | 44 | 115 | 122 | 120 | 119 |
| French Shell Flambeau | | 13 | 9 | 11 | | 35 | 43 | 39 | | 131 | 119 | 125 |
| Nugget | | 14 | 9 | 12 | | 35 | 45 | 40 | | 113 | 112 | 112 |
| Other | 11.8 | 12.2 | 10.2 | 11.4 | 53.4 | 38.3 | 49.0 | 46.9 | 115.3 | 116.8 | 113.9 | 116.5 |
| 5-593Cu | | 12 | 9 | 11 | | 64 | 44 | 54 | | 112 | 101 | 106 |
| 5-593p gri | | 10 | 8 | 9 | | 32 | 45 | 38 | | 105 | 98 | 101 |
| Amish Knuttle | | | 10 | 10 | | | 55 | 55 | | | 140 | 140 |
| Calypso | | | 13 | 13 | | | 45 | 45 | | | 124 | 124 |
| CO 32948 | | | 11 | 11 | | | 44 | 44 | | | 106 | 106 |
| CO 32977 | | | 10 | 10 | | | 42 | 42 | | | 102 | 102 |
| G18689 | 12 | 12 | 10 | 11 | 55 | 44 | 60 | 53 | 115 | 119 | 107 | 114 |
| Magpie | | 12 | 10 | 11 | | 35 | 48 | 41 | | 119 | 110 | 114 |
| Mansel Magic | | 11 | 10 | 10 | | 31 | 42 | 37 | | 113 | 105 | 109 |
| Mrocumiere | | 10 | 10 | 10 | | 33 | 44 | 38 | | 121 | 105 | 113 |
| Orca (USWA-27) | 12 | 11 | 10 | 11 | 51 | 45 | 61 | 52 | 117 | 116 | 112 | 115 |
| Peregrion | | | 9 | 9 | | | 54 | 54 | | | 111 | 111 |
| PI 549794 | | | 9 | 9 | | | 57 | 57 | | | 115 | 115 |
| Royal Burgundy | | 12 | 10 | 11 | | 34 | 43 | 39 | | 139 | 138 | 138 |
| Serene | | 15 | 11 | 13 | | 33 | 43 | 38 | | 112 | 107 | 109 |
| Trout/Jacobs Cattle | 10 | 15 | 11 | 12 | 41 | 32 | 42 | 38 | 114 | 112 | 99 | 108 |
| W 614717 | | | 11 | 11 | | | 64 | 64 | | | 132 | 132 |
| W 614732 | | | 10 | 10 | | | 44 | 44 | | | 123 | 123 |
| W 614734 | | | 13 | 13 | | | 54 | 54 | | | 124 | 124 |
| Pole | 11.7 | 15.7 | 13.7 | 14.7 | 46.7 | 40.7 | | 43.7 | 127.0 | 129.0 | | 128.0 |
| Kentucky Wonder | 12 | 16 | | 14 | 61 | 50 | | 56 | 127 | 127 | | 127 |
| Painted Lady | 11 | 15 | | 13 | 39 | 31 | | 35 | 127 | 133 | | 130 |
| Scarlet Emperor | 12 | 16 | | 14 | 40 | | | 40 | 127 | 127 | | 127 |
| Adzuki | 16.5 | 14.5 | 15.5 | | 49.2 | 70.5 | 59.9 | | 133.5 | 123.5 | | 128.5 |
| Beni Dainagon | | 17 | 16 | 17 | | 55 | 70 | 62 | | 134 | 124 | 129 |
| Erimo | | 16 | 12 | 14 | | 51 | 70 | 61 | | 132 | 124 | 128 |
| Takara | | 17 | 15 | 16 | | 59 | 72 | 66 | | 133 | 125 | 129 |
| WAA 2201(Crimson) | | 16 | 15 | 16 | | 32 | 71 | 51 | | 135 | 121 | 128 |
| Mean | 12.0 | 13.0 | 10.0 | 12 | 46.0 | 36.2 | 47.8 | 43 | 116.0 | 117.0 | 111.0 | 113.6 |
| P Value | 0.000 | 0.0000 | 0.0000 | | 0.0260 | 0.0000 | 0.0000 | | 0.0001 | 0.0000 | 0.0000 | |

Table 3. Plant height (cm) in mid season and at harvest of dry bean varieties at WSU Vancouver REU in 2001, 2002 and 2003.

| Type | Pl. Ht at 1st flw (cm) | | | | Final Pl. Ht. at Hrv (cm) | | | |
|-------------------------------|------------------------|------|------|---------|---------------------------|------|------|---------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| Dark Red Kidney | 27.9 | 47.7 | 40.5 | 40.7 | 25.1 | 32.3 | 29.4 | 29.2 |
| H9659-37-2 | | | 45.0 | 45.0 | | | 32.2 | 32.2 |
| Kintoki | | 49.9 | 39.1 | 44.5 | | 24.5 | 32.6 | 28.6 |
| Montcalm | 27.9 | 45.4 | 41.9 | 38.4 | 25.1 | 40.0 | 28.7 | 31.3 |
| Red Kidney | | | 30.9 | 30.9 | | | 28.3 | 28.3 |
| USWA-39 | | | 42.8 | 42.8 | | | 30.4 | 30.4 |
| W 614718 | | | 42.1 | 42.1 | | | 31.0 | 31.0 |
| W 614719 | | | 38.9 | 38.9 | | | 25.1 | 25.1 |
| W 614722 | | | 44.2 | 44.2 | | | 27.8 | 27.8 |
| W 614724 | | | 42.3 | 42.3 | | | 34.3 | 34.3 |
| W 614725 | | | 42.4 | 42.4 | | | 28.5 | 28.5 |
| W614727 | | | 36.2 | 36.2 | | | 24.0 | 24.0 |
| Light Red Kidney | 30.4 | 51.7 | 37.4 | 37.9 | 26.2 | 39.2 | 30.9 | 30.6 |
| CELRK | 26.4 | 47.3 | 36.9 | 36.9 | 23.4 | 39.2 | 28.1 | 30.2 |
| Kardinal | 34.3 | 56.0 | 41.8 | 44.0 | 29.0 | 39.1 | 39.7 | 35.9 |
| USWA-33 | | | 37.4 | 37.4 | | | 32.1 | 32.1 |
| W 614733 | | | 40.6 | 40.6 | | | 25.0 | 25.0 |
| W 614737 | | | 30.5 | 30.5 | | | 29.8 | 29.8 |
| White Kidney | 26.8 | 45.9 | 37.8 | 39.5 | 23.4 | 38.8 | 31.0 | 33.4 |
| Cannellini | 26.8 | 42.7 | 38.8 | 36.1 | 23.4 | 35.9 | 28.3 | 29.2 |
| Dwane Baptiste | | 49.1 | 36.7 | 42.9 | | 41.7 | 33.6 | 37.7 |
| Great Northern | | | 29 | 29 | | | 22 | 22 |
| BelNeb-RR-1 | | | 25.5 | 25.5 | | | 29.3 | 29.3 |
| Great Northern White | | | 32.4 | 32.4 | | | 14.7 | 14.7 |
| Small White/Navy | 30.3 | 47.2 | 33.9 | 37.2 | 32.5 | 49.3 | 31.6 | 34.4 |
| Arthur | 36.1 | 45.4 | 29.7 | 37.1 | 42.7 | 60.0 | 43.9 | 48.9 |
| Navy Pea | | | 39.2 | 39.2 | | | 25.8 | 25.8 |
| Norstar | 24.5 | 48.9 | 32.7 | 35.4 | 22.2 | 38.5 | 25.1 | 28.6 |
| Small Red/ Red Mexican | 24.1 | 43.4 | 35.2 | 35.3 | 20.5 | 30.5 | 21.8 | 21.8 |
| LeBaron | 22.8 | 40.4 | 32.8 | 32.0 | 18.8 | 29.9 | 26.3 | 25.0 |
| Montezuma Red | 25.8 | 41.9 | 33.5 | 33.7 | 21.3 | 34.1 | 25.1 | 26.8 |
| NW-63 | 23.6 | 47.8 | 32.4 | 34.6 | 21.5 | 27.6 | 25.1 | 24.7 |
| Red Mexican | | | 33.8 | 33.8 | | | 22.6 | 22.6 |
| USRM-20 | | | 28.6 | 28.6 | | | 18.9 | 18.9 |
| W 614720 | | | 37.3 | 37.3 | | | 21.8 | 21.8 |
| W 614723 | | | 36.5 | 36.5 | | | 19.2 | 19.2 |
| W 614726 | | | 37.1 | 37.1 | | | 20.9 | 20.9 |
| W 614728 | | | 39.3 | 39.3 | | | 20.6 | 20.6 |
| W 614731 | | | 37.6 | 37.6 | | | 20.6 | 20.6 |
| W 614736 | | | 38.3 | 38.3 | | | 18.2 | 18.2 |
| Pink | 21.5 | 47.7 | 30.5 | 36.1 | 23.1 | 23.3 | 31.8 | 27.1 |
| UI-537 | 21.5 | 49.6 | 29.2 | 33.4 | 23.1 | 25.1 | 25.7 | 24.6 |
| Pinks | | 45.8 | 31.8 | 38.8 | | 21.4 | 37.9 | 29.7 |
| Black | 30.0 | 43.1 | 34.7 | 37.0 | 25.9 | 37.6 | 30.2 | 31.3 |
| 5-593 Wild Type | | 37.4 | 27.6 | 32.5 | | 29.6 | 23.6 | 26.6 |
| Black Coco | 26.9 | 46.6 | 32.2 | 35.2 | 22.8 | 35.5 | 29.0 | 29.1 |
| H9673-87 | | | 46.5 | 46.5 | | | 38.0 | 38.0 |

| Type | Pl. Ht at 1st flw (cm) | | | | Final Pl. Ht. at Hrv (cm) | | | |
|-------------------------------------|------------------------|-------------|--------------|--------------|---------------------------|-------------|-------------|-------------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| ICB-10-5 | | | 40.2 | 40.2 | | | 32.6 | 32.6 |
| JCB-10-5-14 | 25.2 | 31.2 | 32.2 | 29.5 | 25.7 | 39.7 | 34.4 | 33.3 |
| Major | | 37.5 | 28.4 | 33.0 | | 32.6 | 26.5 | 29.6 |
| Midnight Black Turtle | 36.7 | 52.8 | 34.8 | 41.4 | 30.8 | 47.8 | 36.9 | 38.5 |
| UI-239 | | | 41.0 | 41.0 | | | 27.7 | 27.7 |
| UI-911 | 31.1 | 52.8 | 32.7 | 38.9 | 24.4 | 40.3 | 26.5 | 30.4 |
| W 614721 | | | 31.6 | 31.6 | | | 27.2 | 27.2 |
| Cranberry | 26.2 | 44.3 | 38.5 | 37.8 | 22.1 | 34.4 | 26.3 | 26.7 |
| 95-8186C | | | | | | | 26.6 | 26.6 |
| Andrew Kent | 30.7 | 43.4 | 38.0 | 37.4 | 26.3 | 37.9 | 32.8 | 32.3 |
| Candy | | 52.2 | 47.4 | 49.8 | | 31.7 | 30.2 | 31.0 |
| Cardinal | 26.1 | 47.5 | 37.6 | 37.1 | 22.9 | 33.3 | 24.5 | 26.9 |
| CO 406960 | | | 36.2 | 36.2 | | | 25.1 | 25.1 |
| Etna | 27.5 | 47.4 | 36.2 | 37.0 | 24.6 | 30.6 | 26.5 | 27.2 |
| PR95-055-2-1-16 | 24.4 | 32.6 | | 28.5 | 17.3 | | | 17.3 |
| Speckled Bays | | 40.3 | 42.4 | 41.4 | 19.5 | 35.4 | 25.0 | 26.6 |
| Taylor's | | | 34.7 | 34.7 | | | 28.0 | 28.0 |
| Thort | 28.5 | 48.9 | 34.8 | 37.4 | 24.4 | 43.9 | 24.4 | 30.9 |
| Tongue of Fire | 24.9 | 45.4 | 36.4 | 35.6 | 22.1 | 38.8 | 23.8 | 28.2 |
| USCR-14 | | | 41.4 | 41.4 | | | 29.7 | 29.7 |
| USCR-15 | | | 37.3 | 37.3 | | | 29.9 | 29.9 |
| Vermont Cranberry | 21.5 | 41.4 | 35.4 | 32.8 | 19.5 | 23.4 | 21.6 | 21.5 |
| Volcano | | | 39.1 | 39.1 | | | 22.6 | 22.6 |
| W 614729 | | | 41.7 | 41.7 | | | 23.4 | 23.4 |
| Pinto | | | 40.16 | 40.16 | | | 28.5 | 28.5 |
| Burke | | | 44.6 | 44.6 | | | 28.8 | 28.8 |
| Othello | | | 32.9 | 32.9 | | | 29.4 | 29.4 |
| Pinto | | | 30.7 | 30.7 | | | 28.5 | 28.5 |
| USPT-73 | | | 51.4 | 51.4 | | | 28.5 | 28.5 |
| USPT-CBB-1 | | | 41.2 | 41.2 | | | 27.3 | 27.3 |
| Yellow Eye/Partially Colored | 27.6 | 50.8 | 35.7 | 42.0 | 24.3 | 36.7 | 29.2 | 32.0 |
| Celina's Romano | | 55.1 | | 55.1 | | 35.2 | | 35.2 |
| Maine Yellow Eye | 26.2 | 46.8 | 32.5 | 35.2 | 24.2 | 39.2 | 28.8 | 30.7 |
| Molasses Face | | 61.0 | 43.4 | 52.2 | | 29.4 | 28.7 | 29.1 |
| Old Fashioned Soldier | 28.9 | 46.3 | 32.6 | 35.9 | 24.4 | 43.3 | 28.9 | 32.2 |
| Red Soldier | | 40.1 | 32.3 | 36.2 | | 30.5 | 28.9 | 29.7 |
| Soldier | | | 29.8 | 29.8 | | | 32.0 | 32.0 |
| Stevenson Blue Eye | | 55.6 | 43.4 | 49.5 | | 42.8 | 27.8 | 35.3 |
| Brown or Yellow Beans | | 40.8 | 35.5 | 37.5 | | 32.5 | 27.6 | 29.0 |
| Beka | | 43.4 | 32.2 | 37.8 | | 30.4 | 26.8 | 28.6 |
| Brown Dutch | | | 34.4 | 34.4 | | | 26.7 | 26.7 |
| Childer's Golden | | 28.8 | 33.0 | 30.9 | | 29.2 | 21.9 | 25.6 |
| Hutterite | | 43.0 | 33.0 | 38.0 | | 33.3 | 25.0 | 29.2 |
| Ireland Creek | | 37.7 | 41.1 | 39.4 | | 39.3 | 37.8 | 38.6 |
| Lake Kivu | | 51.8 | 37.5 | 44.7 | | 39.7 | 30.9 | 35.3 |
| Maefax | | 45.9 | 33.9 | 39.9 | | 31.5 | 28.0 | 29.8 |
| Norwegian | | 38.5 | 31.1 | 34.8 | | 32.0 | 30.0 | 31.0 |
| PI 353479 | | | 36.4 | 36.4 | | | 28.0 | 28.0 |
| PI 549776 | | | 35.7 | 35.7 | | | 29.0 | 29.0 |

| Type | Pl. Ht at 1st flw (cm) | | | | Final Pl. Ht. at Hrv (cm) | | | |
|-----------------------|------------------------|-------------|-------------|-------------|---------------------------|-------------|-------------|-------------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| Swedish Brown | | | 40.5 | 40.5 | | | 21.4 | 21.4 |
| Zert | | 37.4 | 37.0 | 37.2 | | 24.8 | 25.5 | 25.2 |
| Flageolet | 25.4 | 45.4 | 31.4 | 36.8 | 24.5 | 33.7 | 24.1 | 28.7 |
| French Flageolet | 25.4 | 46.6 | 32.3 | 34.8 | 24.5 | 31.4 | 22.0 | 26.0 |
| French Shell Flambeau | | 46.6 | 32.1 | 39.4 | | 30.8 | 27.5 | 29.2 |
| Nugget | | 42.9 | 29.8 | 36.4 | | 38.9 | 22.9 | 30.9 |
| Other | 24.9 | 43.7 | 36.7 | 37.7 | 26.7 | 37.4 | 25.8 | 27.6 |
| 5-593Cu | | 45.3 | 27.0 | 36.2 | | | 26.7 | 26.7 |
| 5-593p gri | | 48.4 | 35.3 | 41.9 | | 41.5 | 33.6 | 37.6 |
| Amish Knuttle | | | 38.3 | 38.3 | | | 24.9 | 24.9 |
| Calypso | | | 34.4 | 34.4 | | | 19.1 | 19.1 |
| CO 32948 | | | 34.8 | 34.8 | | | 17.5 | 17.5 |
| CO 32977 | | | 35.6 | 35.6 | | | 24.1 | 24.1 |
| G18689 | 26.7 | 44.1 | 40.8 | 37.2 | 19.6 | 36.8 | 29.6 | 28.7 |
| Magpie | | 54.1 | 32.6 | 43.4 | | 39.1 | 30.3 | 34.7 |
| Mansel Magic | | 53.2 | 43.1 | 48.2 | | 39.8 | 36.0 | 37.9 |
| Mrocumiere | | 51.1 | 38.8 | 45.0 | | 35.4 | 32.7 | 34.1 |
| Orca (USWA-27) | 26.6 | 33.5 | 31.3 | 30.5 | 29.4 | 35.5 | 29.2 | 31.4 |
| Peregrine | | | 41.0 | 41.0 | | | 27.0 | 27.0 |
| PI 549794 | | | 30.4 | 30.4 | | | 18.2 | 18.2 |
| Royal Burgundy | | 44.0 | 38.9 | 41.5 | | 37.0 | 21.2 | 29.1 |
| Serene | | 43.3 | 42.6 | 43.0 | | 39.8 | 27.5 | 33.7 |
| Trout/Jacobs Cattle | 28.5 | 39.5 | 34.6 | 34.2 | 22.3 | 31.8 | 27.4 | 27.2 |
| W 614717 | | | 38.6 | 38.6 | | | 17.9 | 17.9 |
| W 614732 | | | 42.5 | 42.5 | | | 26.8 | 26.8 |
| W 614734 | | | 36.3 | 36.3 | | | 20.2 | 20.2 |
| Pole | 29.8 | 48.8 | 39.3 | 39.3 | 25.9 | 90.7 | 36.6 | 36.6 |
| Kentucky Wonder | 30.8 | 45.6 | | 38.2 | 22.7 | | | 22.7 |
| Painted Lady | 32.8 | 55.8 | | 44.3 | 26.5 | 90.7 | | 58.6 |
| Scarlet Emperor | 25.9 | 45.0 | | 35.5 | 28.4 | | | 28.4 |
| Adzuki | 34.9 | 18.9 | 26.9 | 26.9 | 50.8 | 36.1 | 43.5 | 43.5 |
| Beni Dainagon | | 35.6 | 18.7 | 27.2 | | 60.7 | 33.4 | 47.1 |
| Erimo | | 39.5 | 15.0 | 27.3 | | 43.2 | 28.7 | 36.0 |
| Takara | | 32.3 | 17.7 | 25.0 | | 49.2 | 44.6 | 46.9 |
| WAA 2201(Crimson) | | 32.2 | 24.3 | 28.3 | | 50.1 | 37.7 | 43.9 |
| Mean | 27.0 | 44.3 | 36.0 | | 25.0 | 37.1 | 27.6 | |
| P Value | 0.0260 | 0.0000 | 0.0000 | | 0.0001 | 0.0000 | 0.0000 | |

Table 4. Final plant stand and Total bean yield (g) from 10 ft of dry bean varieties at WSU Vancouver REU in 2001, 2002 and 2003.

| Type | Plant Stand (#) | | | | T Bean Wt (g) | | | |
|-------------------------------|-----------------|-------------|-------------|-------------|---------------|--------------|--------------|--------------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| Dark Red Kidney | 64.0 | 71.5 | 38.1 | 57.9 | 431.2 | 729.4 | 655.7 | 670.5 |
| H9659-37-2 | | | 55 | 55 | | | 671.8 | 671.8 |
| Kintoki | | 68 | 65 | 67 | | 672.6 | 475.5 | 574.1 |
| Montcalm | 64 | 75 | 58 | 66 | 431.2 | 786.1 | 511.5 | 576.3 |
| Red Kidney | | | 42 | 42 | | | 401.0 | 401.0 |
| USWA-39 | | | 50 | 50 | | | 696.5 | 696.5 |
| W 614718 | | | 30 | 30 | | | 826.0 | 826.0 |
| W 614719 | | | 16 | 16 | | | 583.0 | 583.0 |
| W 614722 | | | 45 | 45 | | | 780.0 | 780.0 |
| W 614724 | | | 12 | 12 | | | 656.3 | 656.3 |
| W 614725 | | | 33 | 33 | | | 928.0 | 928.0 |
| W614727 | | | 15 | 15 | | | 683.0 | 683.0 |
| Light Red Kidney | 40.5 | 49.5 | 43.9 | 44.6 | 458.9 | 542.7 | 590.3 | 582.7 |
| CELRK | 36 | 38 | 55 | 43 | 437.9 | 499.4 | 495.0 | 477.4 |
| Kardinal | 45 | 61 | 27 | 44 | 479.9 | 586.0 | 564.0 | 543.3 |
| USWA-33 | | | 65 | 65 | | | 752.3 | 752.3 |
| W 614733 | | | 42 | 42 | | | 637.3 | 637.3 |
| W 614737 | | | 31 | 31 | | | 503.0 | 503.0 |
| White Kidney | 36.0 | 46.5 | 40.6 | 41.0 | 320.4 | 618.1 | 592.3 | 569.1 |
| Cannellini | 36 | 33 | 23 | 31 | 320.4 | 528.0 | 545.8 | 464.7 |
| Dwane Baptiste | | 60 | 58 | 59 | | 708.1 | 638.8 | 673.5 |
| Great Northern | | | 34 | 33.5 | | | 700 | 700 |
| BelNeb-RR-1 | | | 55 | 55 | | | 869.0 | 869.0 |
| Great Northern White | | | 12 | 12 | | | 531.0 | 531.0 |
| Small White/Navy | 31.5 | 33.0 | 42.4 | 35.6 | 473.6 | 430.0 | 641.6 | 574.4 |
| Arthur | 44 | 41 | 29 | 38 | 481.5 | 496.0 | 561.3 | 512.9 |
| Navy Pea | | | 50 | 50 | | | 719.0 | 719.0 |
| Norstar | 19 | 25 | 48 | 31 | 465.6 | 364.0 | 644.5 | 491.4 |
| Small Red/ Red Mexican | 50.0 | 49.3 | 45.8 | 48.4 | 466.8 | 507.0 | 603.5 | 576.7 |
| LeBaron | 56 | 40 | 55 | 50 | 344.4 | 401.5 | 647.5 | 464.5 |
| Montezuma Red | 44 | 69 | 57 | 57 | 401.0 | 606.2 | 553.8 | 520.3 |
| NW-63 | 50 | 39 | 54 | 48 | 655.0 | 513.2 | 701.8 | 623.3 |
| Red Mexican | | | 42 | 42 | | | 470.0 | 470.0 |
| USRM-20 | | | 48 | 48 | | | 747.0 | 747.0 |
| W 614720 | | | 54 | 54 | | | 657.3 | 657.3 |
| W 614723 | | | 32 | 32 | | | 703.5 | 703.5 |
| W 614726 | | | 30 | 30 | | | 445.5 | 445.5 |
| W 614728 | | | 62 | 62 | | | 678.5 | 678.5 |
| W 614731 | | | 16 | 16 | | | 425.0 | 425.0 |
| W 614736 | | | 55 | 55 | | | 608.3 | 608.3 |
| Pink | 41.0 | 56.5 | 15.5 | 37.7 | 592.9 | 414.5 | 453.9 | 472.3 |
| UI-537 | 41 | 66 | 21 | 43 | 592.9 | 369.7 | 358.3 | 440.3 |
| Pinks | | 47 | 11 | 29 | | 459.2 | 549.5 | 504.4 |
| Black | 53.3 | 65.7 | 57.7 | 58.9 | 457.0 | 579.9 | 639.1 | 642.7 |
| 5-593 Wild Type | | 106 | 62 | 84 | | 642.0 | 407.8 | 524.9 |
| Black Coco | 47 | 65 | 59 | 57 | 416.7 | 584.5 | 418.5 | 473.2 |

| Type | Plant Stand (#) | | | | T Bean Wt (g) | | | |
|-------------------------------------|-----------------|-------------|--------------|--------------|---------------|--------------|--------------|---------------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| H9673-87 | | | 76 | 76 | | | 961.8 | 961.8 |
| JCB-10-5 | | | 73 | 73 | | | 804.3 | 804.3 |
| ICB-10-5-14 | | 14 | 59 | 36 | 406.7 | 364.1 | 407.0 | 392.6 |
| Major | | 97 | 66 | 82 | | 649.1 | 442.5 | 545.8 |
| Midnight Black Turtle | 46 | 56 | 66 | 56 | 517.4 | 633.8 | 804.0 | 651.7 |
| UI-239 | | | 67 | 67 | | | 974.5 | 974.5 |
| UI-911 | 67 | 56 | 41 | 55 | 487.1 | 605.8 | 656.0 | 583.0 |
| W 614721 | | | 9 | 9 | | | 515.0 | 515.0 |
| Cranberry | 48.6 | 56.0 | 47.4 | 49.0 | 502.0 | 499.2 | 574.6 | 570.9 |
| 95-8186C | | | 58 | 58 | | | 847.8 | 847.8 |
| Andrew Kent | 54 | 30 | 22 | 35 | 572.6 | 685.3 | 529.8 | 595.9 |
| Candy | | 47 | 55 | 51 | | 436.1 | 232.3 | 334.2 |
| Cardinal | 48 | 65 | 69 | 61 | 452.8 | 506.6 | 519.8 | 493.1 |
| CO 406960 | | | 57 | 57 | | | 586.3 | 586.3 |
| Etna | 63 | 90 | 64 | 72 | 639.5 | 608.0 | 468.0 | 571.8 |
| PR95-055-2-1-16 | 54 | | | 54 | 581.9 | | | 581.9 |
| Speckled Bays | 35 | 68 | 46 | 50 | 357.1 | 400.5 | 504.8 | 420.8 |
| Taylor's | | | 48 | 48 | | | 671.8 | 671.8 |
| Thort | 50 | 47 | 70 | 56 | 452.2 | 532.0 | 532.8 | 505.7 |
| Tongue of Fire | 44 | 57 | 29 | 43 | 502.9 | 294.9 | 501.8 | 433.2 |
| USCR-14 | | | 50 | 50 | | | 529.8 | 529.8 |
| USCR-15 | | | 35 | 35 | | | 723.0 | 723.0 |
| Vermont Cranberry | 41 | 44 | 34 | 40 | 457.1 | 530.5 | 690.3 | 559.3 |
| Volcano | | | 30 | 30 | | | 509.3 | 509.3 |
| W 614729 | | | 45 | 45 | | | 771.3 | 771.3 |
| Pinto | | | 57.12 | 57.12 | | | 628.5 | 628.52 |
| Burke | | | 54 | 54 | | | 670.3 | 670.3 |
| Othello | | | 58 | 58 | | | 626.3 | 626.3 |
| Pinto | | | 46 | 46 | | | 553.0 | 553.0 |
| USPT-73 | | | 63 | 63 | | | 794.0 | 794.0 |
| USPT-CBB-1 | | | 65 | 65 | | | 499.0 | 499.0 |
| Yellow Eye/Partially Colored | 51.0 | 48.0 | 30.2 | 43.1 | 430.7 | 459.6 | 435.1 | 443.1 |
| Celina's Romano | | 30 | | 30 | | 161.3 | | 161.3 |
| Maine Yellow Eye | 46 | 34 | 40 | 40 | 285.5 | 401.5 | 267.0 | 318.0 |
| Molasses Face | | 82 | 24 | 53 | | 562.8 | 532.0 | 547.4 |
| Old Fashioned Soldier | 56 | 62 | 29 | 49 | 575.9 | 634.6 | 302.0 | 504.2 |
| Red Soldier | | 29 | 18 | 23 | | 510.1 | 255.0 | 382.6 |
| Soldier | | | 34 | 34 | | | 634.0 | 634.0 |
| Stevenson Blue Eye | | 51 | 37 | 44 | | 487.4 | 620.8 | 554.1 |
| Brown or Yellow Beans | 47.1 | 37.5 | 42.3 | | 501.4 | 468.6 | 470.8 | |
| Beka | | 59 | 63 | 61 | | 617.6 | 445.0 | 531.3 |
| Brown Dutch | | | 15 | 15 | | | 620.0 | 620.0 |
| Childer's Golden | | 13 | 39 | 26 | | 224.8 | 583.3 | 404.1 |
| Hutterite | | 30 | 30 | 30 | | 308.5 | 565.0 | 436.8 |
| Ireland Creek | | 35 | 59 | 47 | | 554.1 | 574.0 | 564.1 |
| Lake Kivu | | 61 | 32 | 46 | | 541.7 | 431.5 | 486.6 |
| Maefax | | 62 | 51 | 56 | | 550.9 | 509.8 | 530.4 |
| Norwegian | | 64 | 49 | 56 | | 664.2 | 534.0 | 599.1 |

| Type | Plant Stand (#) | | | | T Bean Wt (g) | | | |
|-----------------------|-----------------|-------------|-------------|-------------|---------------|--------------|--------------|--------------|
| Variety | 2001 | 2002 | 2003 | Average | 2001 | 2002 | 2003 | Average |
| PI 353479 | | | 48 | 48 | | | 441.3 | 441.3 |
| PI 549776 | | | 40 | 40 | | | 398.7 | 398.7 |
| Swedish Brown | | | 12 | 12 | | | 206.0 | 206.0 |
| Zert | | 53 | 14 | 34 | | 549.6 | 314.0 | 431.8 |
| Flageolet | 40.0 | 29.0 | 19.1 | 29.4 | 518.1 | 416.3 | 380.5 | 397.7 |
| French Flageolet | 40 | 23 | 24 | 29 | 518.1 | 417.1 | 632.0 | 522.4 |
| French Shell Flambeau | | 35 | 2 | 19 | | 575.6 | 109.0 | 342.3 |
| Nugget | | | 31 | 31 | | 256.2 | 400.5 | 328.4 |
| Other | 35.0 | 64.4 | 41.0 | 46.8 | 503.6 | 538.7 | 527.8 | 521.9 |
| 5-593Cu | | 104 | 69 | 86 | | 558.0 | 360.3 | 459.2 |
| 5-593p gri | | 128 | 56 | 92 | | 447.2 | 428.8 | 438.0 |
| Amish Knuttle | | | 24 | 24 | | | 842.0 | 842.0 |
| Calypso | | | 7 | 7 | | | 240.0 | 240.0 |
| CO 32948 | | | 35 | 35 | | | 562.5 | 562.5 |
| CO 32977 | | | 25 | 25 | | | 451.0 | 451.0 |
| G18689 | 33 | 38 | 55 | 42 | 681.3 | 756.2 | 999.5 | 812.3 |
| Magpie | | 44 | 55 | 49 | | 746.4 | 450.0 | 598.2 |
| Mansel Magic | | 66 | 39 | 53 | | 627.7 | 539.0 | 583.4 |
| Mrocumiere | | 68 | 63 | 65 | | 628.9 | 721.8 | 675.4 |
| Orca (USWA-27) | 41 | 64 | 11 | 39 | 435.2 | 563.1 | 403.3 | 467.2 |
| Peregrion | | | 98 | 98 | | | 544.0 | 544.0 |
| PI 549794 | | | 55 | 55 | | | 393.5 | 393.5 |
| Royal Burgundy | | 74 | 50 | 62 | | 374.0 | 580.3 | 477.2 |
| Serene | | 33 | 27 | 30 | | 327.4 | 513.8 | 420.6 |
| Trout/Jacobs Cattle | 43 | 25 | 39 | 36 | 394.3 | 357.7 | 444.8 | 398.9 |
| W 614717 | | | 25 | 25 | | | 693.5 | 693.5 |
| W 614732 | | | 44 | 44 | | | 660.0 | 660.0 |
| W 614734 | | | 4 | 4 | | | 200.0 | 200.0 |
| Pole | 41.0 | 20.0 | | 30.5 | 173.4 | 186.6 | | 176.6 |
| Kentucky Wonder | 43.0 | | | 43 | 197.0 | | | 197.0 |
| Painted Lady | 48.0 | 20.0 | | 34 | 167.4 | 186.6 | | 177.0 |
| Scarlet Emperor | 32.0 | | | 32 | 155.9 | | | 155.9 |
| Adzuki | | 47.8 | 18.4 | 33.1 | | 327.8 | 161.5 | 244.6 |
| Beni Dainagon | | 47.0 | 12.5 | 30 | | 536.3 | 134.3 | 335.3 |
| Erimo | | 44.0 | 21.0 | 33 | | 227.4 | 122.0 | 174.7 |
| Takara | | 62.0 | 27.0 | 45 | | 247.9 | 233.7 | 240.8 |
| WAA 2201(Crimson) | | 38.0 | 13.0 | 26 | | 299.5 | 155.8 | 227.7 |
| Mean | 43.0 | 54.0 | 41.0 | 46 | 446.0 | 497.7 | 549.3 | 497.7 |
| P Value | 0.0001 | 0.0000 | 0.0000 | | 0.0001 | 0.0000 | 0.0000 | |

Table 5. Weight of 100 beans (g), length (Lth) and width (Wth) of 25 beans (cm) at WSU Vancouver REU in 2001 and 2002.

| Type | Wt 100 beans | | | | Lth 25 beans | | | | Wdth 25 beans | | | |
|-------------------------------|--------------|------|------|------|--------------|------|------|------|---------------|------|------|------|
| Variety | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver |
| Dark Red Kidney | 51.9 | 76.2 | 54.6 | 55.7 | 39.3 | 37.3 | 36.9 | 36.9 | 19.2 | 21.9 | 18.7 | 18.8 |
| H9659-37-2 | | | 54.0 | 54.0 | | | 38.8 | 38.8 | | | 19.1 | 19.1 |
| Kintoki | | 67.5 | 62.3 | 64.9 | | 34.7 | 35.3 | 35.0 | | 21.7 | 21.8 | 21.8 |
| Montcalm | 51.9 | 84.9 | 54.3 | 63.7 | 39.3 | 39.9 | 39.3 | 39.5 | 19.2 | 22.0 | 19.0 | 20.1 |
| Red Kidney | | | 57.0 | 57.0 | | | 42.0 | 42.0 | | | 20.0 | 20.0 |
| USWA-39 | | | 56.5 | 56.5 | | | 40.5 | 40.5 | | | 20.6 | 20.6 |
| W 614718 | | | 65.0 | 65.0 | | | 37.5 | 37.5 | | | 19.0 | 19.0 |
| W 614719 | | | 46.8 | 46.8 | | | 27.0 | 27.0 | | | 16.7 | 16.7 |
| W 614722 | | | 48.3 | 48.3 | | | 35.0 | 35.0 | | | 17.3 | 17.3 |
| W 614724 | | | 53.3 | 53.3 | | | 37.0 | 37.0 | | | 18.1 | 18.1 |
| W 614725 | | | 51.0 | 51.0 | | | 36.4 | 36.4 | | | 17.4 | 17.4 |
| W614727 | | | 52.0 | 52.0 | | | 37.5 | 37.5 | | | 17.0 | 17.0 |
| Light Red Kidney | 60.0 | 61.4 | 57.6 | 58.1 | 42.3 | 37.8 | 38.3 | 38.3 | 21.3 | 20.7 | 19.5 | 19.8 |
| CELRK | 63.0 | 59.5 | 60.8 | 61.1 | 42.3 | 37.0 | 41.5 | 40.3 | 20.8 | 21.1 | 20.5 | 20.8 |
| Kardinal | 57.0 | 63.2 | 56.3 | 58.8 | 42.2 | 38.5 | 38.8 | 39.8 | 21.8 | 20.3 | 19.3 | 20.5 |
| USWA-33 | | | 67.8 | 67.8 | | | 42.3 | 42.3 | | | 20.8 | 20.8 |
| W 614733 | | | 53.7 | 53.7 | | | 34.0 | 34.0 | | | 18.5 | 18.5 |
| W 614737 | | | 49.3 | 49.3 | | | 35.0 | 35.0 | | | 18.3 | 18.3 |
| White Kidney | 59.3 | 54.6 | 49.2 | 53.8 | 38.5 | 36.2 | 35.5 | 36.3 | 20.1 | 19.4 | 17.5 | 18.6 |
| Cannellini | 59.3 | 52.2 | 42.8 | 51.4 | 38.5 | 37.4 | 33.9 | 36.6 | 20.1 | 20.7 | 17.4 | 19.4 |
| Dwane Baptiste | | 57.0 | 55.5 | 56.3 | | 34.9 | 37.0 | 36.0 | | 18.1 | 17.6 | 17.9 |
| Great Northern | | | 35 | 35 | | | 28 | 28 | | | 17 | 17 |
| BelNeb-RR-1 | | | 40.0 | 40.0 | | | 29.0 | 29.0 | | | 17.5 | 17.5 |
| Great Northern White | | | 29.0 | 29.0 | | | 26.5 | 26.5 | | | 17.0 | 17.0 |
| Small White/Navy | 16.3 | 17.3 | 22.1 | 19.9 | 21.0 | 21.5 | 22.8 | 22.3 | 14.2 | 14.3 | 15.3 | 15.0 |
| Arthur | 14.7 | 16.8 | 22.5 | 18.0 | 20.9 | 20.9 | 22.4 | 21.4 | 14.0 | 14.0 | 14.6 | 14.2 |
| Navy Pea | | | 23.0 | 23.0 | | | 23.5 | 23.5 | | | 16.0 | 16.0 |
| Norstar | 17.8 | 17.7 | 20.8 | 18.8 | 21.1 | 22.1 | 22.5 | 21.9 | 14.4 | 14.6 | 15.3 | 14.8 |
| Small Red/ Red Mexican | 35.2 | 43.3 | 35.3 | 35.4 | 27.7 | 27.6 | 28.0 | 27.8 | 18.2 | 19.7 | 17.9 | 18.0 |
| LeBaron | 34.7 | 61.3 | 41.3 | 45.8 | 28.2 | 28.1 | 29.8 | 28.7 | 18.7 | 19.0 | 19.4 | 19.0 |
| Montezuma Red | 36.3 | 35.0 | 36.5 | 35.9 | 26.5 | 26.0 | 28.4 | 27.0 | 16.7 | 20.8 | 18.0 | 18.5 |
| NW-63 | 34.6 | 33.6 | 38.3 | 35.5 | 28.4 | 28.8 | 28.8 | 28.7 | 19.2 | 19.4 | 18.9 | 19.2 |
| Red Mexican | | | 39.0 | 39.0 | | | 30.0 | 30.0 | | | 19.5 | 19.5 |
| USRM-20 | | | 46.0 | 46.0 | | | 31.3 | 31.3 | | | 20.9 | 20.9 |
| W 614720 | | | 29.5 | 29.5 | | | 26.6 | 26.6 | | | 16.6 | 16.6 |
| W 614723 | | | 30.8 | 30.8 | | | 26.1 | 26.1 | | | 16.1 | 16.1 |
| W 614726 | | | 32.5 | 32.5 | | | 26.5 | 26.5 | | | 17.0 | 17.0 |
| W 614728 | | | 29.5 | 29.5 | | | 27.4 | 27.4 | | | 17.4 | 17.4 |
| W 614731 | | | 33.0 | 33.0 | | | 27.0 | 27.0 | | | 17.0 | 17.0 |
| W 614736 | | | 31.5 | 31.5 | | | 26.3 | 26.3 | | | 16.5 | 16.5 |
| Pink | 36.4 | 33.3 | 38.7 | 35.6 | 28.1 | 27.3 | 28.5 | 27.6 | 18.3 | 17.8 | 18.9 | 18.2 |
| UI-537 | 36.4 | 33.3 | 44.3 | 38.0 | 28.1 | 28.6 | 30.1 | 28.9 | 18.3 | 18.4 | 19.5 | 18.7 |

| Type Variety | Wt 100 beans | | | | Lth 25 beans | | | | Wdth 25 beans | | | | |
|--------------------------------------|--------------|--------------|--------------|-------------|--------------|-------------|-------------|-------------|---------------|--------------|--------------|-------------|------|
| | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver | |
| Pinks | | 33.3 | 33.0 | 33.2 | | 25.9 | 26.8 | 26.4 | | 17.2 | 18.3 | 17.8 | |
| Black | 28.5 | 29.1 | 30.9 | 30.3 | 24.7 | 26.0 | 26.8 | 26.5 | 16.9 | 16.4 | 16.4 | 16.5 | |
| 5-593 Wild Type | | 21.3 | 18.3 | 19.8 | | 22.0 | 22.4 | 22.2 | | 14.5 | 14.3 | 14.4 | |
| Black Coco | 54.3 | 56.1 | 50.5 | 53.6 | 30.6 | 29.9 | 30.6 | 30.4 | 21.8 | 22.9 | 20.8 | 21.8 | |
| H9673-87 | | | 24.3 | 24.3 | | | 23.3 | 23.3 | | | 15.6 | 15.6 | |
| ICB-10-5 | | | 27.8 | 27.8 | | | 25.3 | 25.3 | | | 16.9 | 16.9 | |
| ICB-10-5-14 | 21.5 | 21.8 | 31.7 | 25.0 | 23.7 | 24.8 | 25.5 | 24.7 | 16.1 | 16.3 | 17.0 | 16.5 | |
| Major | | 36.0 | 32.5 | 34.3 | | 35.0 | 34.6 | 34.8 | | 14.5 | 14.3 | 14.4 | |
| Midnight Black Turtle | 17.9 | 18.8 | 22.0 | 19.6 | 22.3 | 19.9 | 22.8 | 21.7 | 14.7 | 16.0 | 15.2 | 15.3 | |
| UI-239 | | | 37.8 | 37.8 | | | 26.4 | 26.4 | | | 20.4 | 20.4 | |
| UI-911 | 20.1 | 20.4 | 25.3 | 21.9 | 22.0 | 24.2 | 24.0 | 23.4 | 14.9 | 14.3 | 15.1 | 14.8 | |
| W 614721 | | | 39.0 | 39.0 | | | 33.0 | 33.0 | | | 14.5 | 14.5 | |
| Cranberry | 55.1 | 67.7 | 59.0 | 59.4 | 32.0 | 35.9 | 34.0 | 33.7 | 22.0 | 21.5 | 21.7 | 21.6 | |
| 95-8186C | | | 61.0 | 61.0 | | | 34.3 | 34.3 | | | 20.9 | 20.9 | |
| Andrew Kent | 58.3 | 74.4 | 69.8 | 67.5 | 31.3 | 43.0 | 43.4 | 39.2 | 27.4 | 20.7 | 21.0 | 23.0 | |
| Candy | | 139.0 | 65.8 | 102.4 | | 46.0 | 42.1 | 44.1 | | 22.5 | 20.3 | 21.4 | |
| Cardinal | 63.8 | 62.0 | 58.8 | 61.5 | 34.0 | 35.5 | 34.9 | 34.8 | 22.7 | 21.6 | 21.9 | 22.1 | |
| CO 406960 | | | 50.0 | 50.0 | | | 31.8 | 31.8 | | | 21.0 | 21.0 | |
| Etna | 69.7 | 62.5 | 59.8 | 64.0 | 35.0 | 35.6 | 33.6 | 34.7 | 22.3 | 21.7 | 21.5 | 21.8 | |
| PR95-055-2-1-16 | 36.8 | | | 36.8 | 31.3 | | | 31.3 | 19.2 | | | 19.2 | |
| Speckled Bays | 49.5 | 49.4 | 53.5 | 50.8 | 28.3 | 31.2 | 31.6 | 30.4 | 20.1 | 22.7 | 21.5 | 21.4 | |
| Taylor's | | | 57.5 | 57.5 | | | 29.4 | 29.4 | | | 24.4 | 24.4 | |
| Thort | 55.3 | 53.7 | 58.5 | 55.8 | 33.0 | 32.8 | 30.4 | 32.1 | 22.6 | 21.2 | 25.0 | 22.9 | |
| Tongue of Fire | 58.8 | 52.0 | 64.5 | 58.4 | 32.6 | 32.4 | 33.0 | 32.7 | 22.9 | 22.6 | 22.8 | 22.8 | |
| USCR-14 | | | 56.5 | 56.5 | | | 35.8 | 35.8 | | | 21.1 | 21.1 | |
| USCR-15 | | | 65.0 | 65.0 | | | 37.4 | 37.4 | | | 22.4 | 22.4 | |
| Vermont Cranberry | 48.8 | 48.5 | 52.5 | 49.9 | 30.6 | 30.6 | 31.5 | 30.9 | 19.0 | 19.1 | 19.0 | 19.0 | |
| Volcano | | | 68.0 | 68.0 | | | 33.6 | 33.6 | | | 23.3 | 23.3 | |
| W 614729 | | | 44.5 | 44.5 | | | 27.4 | 27.4 | | | 18.9 | 18.9 | |
| Pinto | | 44.42 | 44.42 | | | 32.3 | 32.3 | | | 19.46 | 19.46 | | |
| Burke | | | 44.3 | 44.3 | | | 31.5 | 31.5 | | | 20.9 | 20.9 | |
| Othello | | | 43.8 | 43.8 | | | 31.6 | 31.6 | | | 20.4 | 20.4 | |
| Pinto | | | 41.0 | 41.0 | | | 31.5 | 31.5 | | | 16.0 | 16.0 | |
| USPT-73 | | | 48.5 | 48.5 | | | 34.4 | 34.4 | | | 20.0 | 20.0 | |
| USPT-CBB-1 | | | 44.5 | 44.5 | | | 32.5 | 32.5 | | | 20.0 | 20.0 | |
| Yellow Eye/ Partially Colored | 54.9 | 52.0 | 55.9 | 54.1 | 34.1 | 34.0 | 34.9 | 34.7 | 19.8 | 20.2 | 19.7 | 20.0 | |
| Celina's Romano | | | 54.3 | | 54.3 | | 37.0 | | 37.0 | | 23.0 | | |
| Maine Yellow Eye | 43.5 | 46.9 | 48.0 | 46.1 | 28.0 | 29.6 | 30.3 | 29.3 | 19.6 | 19.8 | 19.6 | 19.7 | |
| Molasses Face | | | 45.7 | 50.8 | 48.3 | | 29.4 | 30.4 | 29.9 | | 19.8 | 20.3 | 20.1 |
| Old Fashioned Soldier | 66.2 | 55.0 | 75.8 | 65.7 | 40.2 | 41.5 | 42.5 | 41.4 | 20.0 | 20.3 | 20.6 | 20.3 | |
| Red Soldier | | 59.5 | 51.5 | 55.5 | | 37.5 | 38.3 | 37.9 | | 18.8 | 18.5 | 18.7 | |
| Soldier | | | 58.0 | 58.0 | | | 38.0 | 38.0 | | | 18.5 | 18.5 | |
| Stevenson Blue Eye | 50.3 | 51.3 | 50.8 | | 28.9 | 30.1 | 29.5 | | 19.5 | 20.4 | | 20.0 | |
| Brown or Yellow Beans | 42.8 | 46.5 | 46.2 | | 28.4 | 29.9 | 29.9 | | 18.7 | 18.7 | 18.7 | | |
| Beka | | 42.4 | 40.5 | 41.5 | | 26.4 | 27.1 | 26.8 | | 18.3 | 18.5 | 18.4 | |
| Brown Dutch | | | 48.0 | 48.0 | | | 32.0 | 32.0 | | | 19.5 | 19.5 | |
| Childer's Golden | 21.6 | 29.3 | 25.5 | | 21.6 | 22.5 | 22.1 | | 16.0 | 16.9 | | 16.5 | |
| Hutterite | | 47.2 | 47.7 | 47.5 | | 31.0 | 29.2 | 30.1 | | 19.8 | 18.3 | 19.1 | |

| Type | Wt 100 beans | | | | Lth 25 beans | | | | Wdth 25 beans | | | |
|-----------------------|--------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|
| Variety | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver | 2001 | 2002 | 2003 | Aver |
| Ireland Creek | | 54.5 | 51.0 | 52.8 | | 36.5 | 35.5 | 36.0 | | 19.3 | 18.0 | 18.7 |
| Lake Kivu | | 52.1 | 48.3 | 50.2 | | 26.4 | 27.0 | 26.7 | | 19.3 | 19.3 | 19.3 |
| Maefax | | 41.8 | 42.0 | 41.9 | | 26.0 | 27.4 | 26.7 | | 18.4 | 19.1 | 18.8 |
| Norwegian | | 37.8 | 40.5 | 39.2 | | 33.4 | 31.0 | 32.2 | | 17.8 | 16.8 | 17.3 |
| PI 353479 | | | 58.3 | 58.3 | | | 35.5 | 35.5 | | | 19.6 | 19.6 |
| PI 549776 | | | 57.3 | 57.3 | | | 35.2 | 35.2 | | | 20.0 | 20.0 |
| Swedish Brown | | | 45.0 | 45.0 | | | 29.5 | 29.5 | | | 18.0 | 18.0 |
| Zert | | 44.8 | 49.5 | 47.2 | | 25.8 | 27.0 | 26.4 | | 20.5 | 20.5 | 20.5 |
| Flageolet | 25.4 | 30.4 | 35.7 | 32.0 | 31.0 | 32.8 | 33.7 | 33.0 | 15.0 | 16.4 | 15.8 | 16.0 |
| French Flageolet | 25.4 | 31.5 | 37.0 | 31.3 | 31.0 | 34.4 | 32.8 | 32.7 | 15.0 | 16.4 | 15.5 | 15.6 |
| French Shell Flambeau | | 27.6 | 33.0 | 30.3 | | 30.1 | 35.0 | 32.6 | | 15.3 | 16.5 | 15.9 |
| Nugget | | 32.0 | 37.0 | 34.5 | | 34.0 | 33.4 | 33.7 | | 17.5 | 15.5 | 16.5 |
| Other | 40.9 | 49.5 | 42.4 | 43.6 | 31.0 | 31.4 | 30.7 | 30.5 | 17.9 | 19.0 | 18.0 | 18.2 |
| 5-593Cu | | 22.0 | 20.8 | 21.4 | | 21.5 | 23.0 | 22.3 | | 14.0 | 17.1 | 15.6 |
| 5-593p gri | | 24.6 | 25.5 | 25.1 | | 24.5 | 24.9 | 24.7 | | 16.5 | 15.5 | 16.0 |
| Amish Knuttle | | | 28.0 | 28.0 | | | 24.0 | 24.0 | | | 17.0 | 17.0 |
| Calypso | | | 53.0 | 53.0 | | | 29.5 | 29.5 | | | 22.0 | 22.0 |
| CO 32948 | | | 46.5 | 46.5 | | | 33.8 | 33.8 | | | 20.8 | 20.8 |
| CO 32977 | | | 45.3 | 45.3 | | | 32.0 | 32.0 | | | 19.5 | 19.5 |
| G18689 | 23.6 | 40.9 | 29.5 | 31.3 | 24.6 | 25.1 | 25.6 | 25.1 | 15.8 | 16.7 | 16.8 | 16.4 |
| Magpie | | 35.2 | 37.5 | 36.4 | | 36.4 | 36.6 | 36.5 | | 16.5 | 15.1 | 15.8 |
| Mansel Magic | | 100.2 | 64.5 | 82.4 | | 30.0 | 34.3 | 32.2 | | 22.3 | 22.8 | 22.6 |
| Mrocumiere | | 54.7 | 53.8 | 54.3 | | 39.1 | 39.3 | 39.2 | | 19.0 | 17.8 | 18.4 |
| Orca (USWA-27) | 32.5 | 35.4 | 33.0 | 33.6 | 28.2 | 28.3 | 28.3 | 28.3 | 18.1 | 17.8 | 17.1 | 17.7 |
| Peregrion | | | 32.0 | 32.0 | | | 28.5 | 28.5 | | | 16.0 | 16.0 |
| PI 549794 | | | 23.3 | 23.3 | | | 25.3 | 25.3 | | | 15.0 | 15.0 |
| Royal Burgundy | | 49.3 | 39.8 | 44.6 | | 34.3 | 34.4 | 34.4 | | 24.1 | 15.9 | 20.0 |
| Serene | | 66.2 | 74.3 | 70.3 | | 34.6 | 35.8 | 35.2 | | 22.8 | 22.4 | 22.6 |
| Trout/Jacobs Cattle | 66.5 | 66.7 | 63.5 | 65.6 | 40.1 | 39.8 | 39.1 | 39.7 | 19.9 | 20.2 | 18.6 | 19.6 |
| W 614717 | | | 31.5 | 31.5 | | | 31.0 | 31.0 | | | 17.0 | 17.0 |
| W 614732 | | | 55.0 | 55.0 | | | 33.7 | 33.7 | | | 18.7 | 18.7 |
| W 614734 | | | 49.0 | 49.0 | | | 25.0 | 25.0 | | | 16.0 | 16.0 |
| Pole | 77.3 | 117.9 | 79.5 | 43.9 | 54.0 | | 44.7 | 24.6 | 30.0 | | 24.7 | |
| Kentucky Wonder | 38.8 | | | 38.8 | 34.9 | | | 34.9 | 18 | | | 18.0 |
| Painted Lady | 104.5 | 117.9 | | 111.2 | 49.5 | 54 | | 51.8 | 29.3 | 30 | | 29.7 |
| Scarlet Emperor | 88.5 | | | 88.5 | 47.4 | | | 47.4 | 26.4 | | | 26.4 |
| Adzuki | 28.4 | 12.7 | 20.6 | | 21.0 | 17.5 | 19.3 | | 13.6 | 12.1 | 12.8 | |
| Beni Dainagon | | 68.2 | 15.8 | 42 | | 28.3 | 19.3 | 23.8 | | 17.4 | 13 | 15.2 |
| Erimo | | 8.4 | 10.5 | 9.45 | | 17.3 | 17 | 17.2 | | 11.8 | 12 | 11.9 |
| Takara | | 13.5 | 10.7 | 12.1 | | 18 | 16.5 | 17.3 | | 12 | 11.2 | 11.6 |
| WAA 2201(Crimson) | | 23.5 | 13.8 | 18.65 | | 20.5 | 17.3 | 18.9 | | 13.1 | 12.1 | 12.6 |
| Mean | 47.0 | 47.5 | 44.3 | 46.26 | 32 | 31 | 31 | | 20 | 18.8 | 18.4 | |
| P Value | 0.0001 | 0.0000 | 0.0000 | | 0.0001 | 0.0000 | 0.0000 | | 0.0091 | 0.0000 | 0.0000 | |

Table 6. Average pod length (cm) and number of beans per pod at WSU Vancouver REU in 2001, 2002 and 2003.

| Type | Pod Length (cm) | | | | # Beans/pod |
|-------------------------------|-----------------|------|------|---------|-------------|
| Variety | 2001 | 2002 | 2003 | Average | 2003 |
| Dark Red Kidney | 11.6 | 10.7 | 11.2 | 11.2 | 4.4 |
| H9659-37-2 | | | 11.4 | 11.4 | 5.5 |
| Kintoki | | 9.5 | 9.3 | 9.4 | 3.3 |
| Montcalm | 11.6 | 11.8 | 11.7 | 11.7 | 4.2 |
| Red Kidney | | | 11.3 | 11.3 | 4.1 |
| USWA-39 | | | 11.4 | 11.4 | 3.8 |
| W 614718 | | | 11.5 | 11.5 | 4.4 |
| W 614719 | | | 10.4 | 10.4 | 4.8 |
| W 614722 | | | 12.6 | 12.6 | 4.8 |
| W 614724 | | | 12.2 | 12.2 | 4.8 |
| W 614725 | | | 12.1 | 12.1 | 4.7 |
| W614727 | | | 9.6 | 9.6 | 4.4 |
| Light Red Kidney | 13.2 | 12.1 | 11.9 | 12.3 | 4.2 |
| CELRK | 12.8 | 12.0 | 11.1 | 12.0 | 3.5 |
| Kardinal | 13.5 | 12.2 | 11.1 | 12.3 | 4.1 |
| USWA-33 | | | 12.5 | 12.5 | 4.2 |
| W 614733 | | | 11.4 | 11.4 | 4.0 |
| W 614737 | | | 13.3 | 13.3 | 5.0 |
| White Kidney | 13.4 | 12.4 | 10.8 | 11.8 | 3.8 |
| Cannellini | 13.4 | 12.5 | 11.1 | 12.3 | 3.9 |
| Dwane Baptiste | | 12.3 | 10.4 | 11.4 | 3.7 |
| Great Northern | | | 10 | 10 | 5 |
| BelNeb-RR-1 | | | 10.3 | 10.3 | 3.4 |
| Great Northern White | | | 10.1 | 10.1 | 6.4 |
| Small White/Navy | 8.8 | 8.3 | 9.0 | 9.1 | 5.5 |
| Arthur | 9.2 | 8.0 | 8.1 | 8.4 | 5.3 |
| Navy Pea | | | 10.1 | 10.1 | 5.9 |
| Norstar | 8.4 | 8.6 | 8.9 | 8.6 | 5.4 |
| Small Red/ Red Mexican | 9.6 | 9.6 | 9.7 | 9.8 | 5.1 |
| LeBaron | 9.5 | 10.0 | 9.0 | 9.5 | 4.2 |
| Montezuma Red | 9.5 | 9.8 | 8.2 | 9.2 | 4.0 |
| NW-63 | 9.9 | 9.1 | 9.0 | 9.3 | 4.3 |
| Red Mexican | | | 8.7 | 8.7 | 4.4 |
| USRM-20 | | | 9.9 | 9.9 | 4.5 |
| W 614720 | | | 9.5 | 9.5 | 5.2 |
| W 614723 | | | 10.2 | 10.2 | 5.9 |
| W 614726 | | | 9.9 | 9.9 | 6.1 |
| W 614728 | | | 10.3 | 10.3 | 5.5 |
| W 614731 | | | 11.7 | 11.7 | 6.9 |
| W 614736 | | | 9.8 | 9.8 | 5.4 |
| Pink | 9.3 | 9.5 | 9.1 | 9.2 | 4.9 |
| UI-537 | 9.3 | 9.9 | 9.5 | 9.6 | 4.9 |
| Pinks | | 9.1 | 8.7 | 8.9 | 4.9 |
| Black | 10.0 | 10.3 | 9.3 | 9.8 | 5.2 |
| 5-593 Wild Type | | 10.7 | 8.2 | 9.5 | 5.5 |
| Black Coco | 11.2 | 10.8 | 8.9 | 10.3 | 3.3 |
| H9673-87 | | | 9.5 | 9.5 | 6.1 |

| Type | Pod Length (cm) | | | | # Beans/pod |
|-------------------------------------|-----------------|-------------|-------------|-------------|--------------|
| Variety | 2001 | 2002 | 2003 | Average | 2003 |
| ICB-10-5 | | | 9.1 | 9.1 | 5.3 |
| JCB-10-5-14 | 8.9 | 9.3 | 8.8 | 9.0 | 4.5 |
| Major | | 12.7 | 12.0 | 12.4 | 4.6 |
| Midnight Black Turtle | 10.1 | 9.5 | 8.4 | 9.3 | 5.1 |
| UI-239 | | | 8.2 | 8.2 | 6.1 |
| UI-911 | 9.9 | 9.0 | 8.8 | 9.2 | 6.1 |
| W 614721 | | | 11.5 | 11.5 | 5.0 |
| Cranberry | 12.3 | 11.8 | 10.6 | 11.1 | 4.1 |
| 95-8186C | | | 11.6 | 11.6 | 4.7 |
| Andrew Kent | 13.0 | 12.3 | 11.5 | 12.3 | 3.7 |
| Candy | | 14.0 | 11.5 | 12.8 | 3.1 |
| Cardinal | 12.9 | 10.7 | 9.7 | 11.1 | 3.9 |
| CO 406960 | | | 9.2 | 9.2 | 4.2 |
| Etna | 14.1 | 12.0 | 10.7 | 12.3 | 3.8 |
| PR95-055-2-1-16 | 9.9 | | | 9.9 | |
| Speckled Bays | 10.4 | 10.2 | 9.1 | 9.9 | 3.6 |
| Taylor's | | | 9.9 | 9.9 | 4.0 |
| Thort | 13.4 | 11.7 | 10.3 | 11.8 | 4.1 |
| Tongue of Fire | 11.1 | 11.3 | 11.3 | 11.2 | 4.5 |
| USCR-14 | | | 11.2 | 11.2 | 4.1 |
| USCR-15 | | | 12.2 | 12.2 | 4.4 |
| Vermont Cranberry | 13.3 | 12.5 | 11.1 | 12.3 | 4.4 |
| Volcano | | | 11.4 | 11.4 | 4.0 |
| W 614729 | | | 8.4 | 8.4 | 4.5 |
| Pinto | | | 9.76 | 9.76 | 4.425 |
| Burke | | | 9.0 | 9.0 | |
| Othello | | | 9.8 | 9.8 | 4.2 |
| Pinto | | | 9.5 | 9.5 | 5.1 |
| USPT-73 | | | 11.3 | 11.3 | 4.8 |
| USPT-CBB-1 | | | 9.2 | 9.2 | 3.6 |
| Yellow Eye/Partially Colored | 12.1 | 10.8 | 9.8 | 10.5 | 3.8 |
| Celina's Romano | | 10.7 | | 10.7 | |
| Maine Yellow Eye | 10.2 | 8.8 | 7.0 | 8.7 | 2.4 |
| Molasses Face | | 8.7 | 8.4 | 8.6 | 4.3 |
| Old Fashioned Soldier | 13.9 | 13.0 | 11.1 | 12.7 | 3.5 |
| Red Soldier | | 12.9 | 11.2 | 12.1 | |
| Soldier | | | 11.0 | 11.0 | 4.0 |
| Stevenson Blue Eye | | 10.6 | 9.8 | 10.2 | 4.7 |
| Brown or Yellow Beans | 10.0 | 9.3 | 9.6 | 9.6 | 3.8 |
| Beka | | 9.0 | 7.8 | 8.4 | 3.5 |
| Brown Dutch | | | 9.4 | 9.4 | 3.6 |
| Childer's Golden | | 8.9 | 8.1 | 8.5 | 4.2 |
| Hutterite | | 10.1 | 9.7 | 9.9 | 4.9 |
| Ireland Creek | | 10.8 | 10.5 | 10.7 | 4.1 |
| Lake Kivu | | 8.7 | 8.5 | 8.6 | 3.7 |
| Maefax | | 9.3 | 7.7 | 8.5 | 3.4 |
| Norwegian | | 12.5 | 11.0 | 11.8 | 4.4 |
| PI 353479 | | | 10.2 | 10.2 | 3.3 |

| Type | Pod Length (cm) | | | | # Beans/pod |
|-----------------------|-----------------|--------|--------|---------|-------------|
| Variety | 2001 | 2002 | 2003 | Average | 2003 |
| PI 549776 | | | 10.0 | 10.0 | 3.3 |
| Swedish Brown | | | 8.8 | 8.8 | 3.7 |
| Zert | | 10.5 | 9.4 | 10.0 | 4.0 |
| Flageolet | 12.7 | 11.2 | 11.2 | 11.4 | 4.6 |
| French Flageolet | 12.7 | 10.8 | 11.0 | 11.5 | 4.2 |
| French Shell Flambeau | | 12.0 | 11.2 | 11.6 | 4.5 |
| Nugget | | 10.8 | 11.5 | 11.2 | 5.2 |
| Other | 11.8 | 11.0 | 10.4 | 10.6 | 4.5 |
| 5-593Cu | | 7.7 | 7.7 | 7.7 | 3.8 |
| 5-593p gri | | 8.4 | 8.3 | 8.4 | 4.5 |
| Amish Knuttle | | | 10.7 | 10.7 | 4.4 |
| Calypso | | | 11.4 | 11.4 | 4.7 |
| CO 32948 | | | 9.4 | 9.4 | 4.3 |
| CO 32977 | | | 10.6 | 10.6 | 4.4 |
| G18689 | 10.5 | 10.2 | 9.4 | 10.0 | 6.0 |
| Magpie | | 11.6 | 13.2 | 12.4 | 4.1 |
| Mansel Magic | | 11.0 | 10.0 | 10.5 | 3.4 |
| Mrocumiere | | 13.3 | 12.5 | 12.9 | 4.1 |
| Orca (USWA-27) | 9.4 | 9.6 | 9.4 | 9.5 | 4.9 |
| Peregrine | | | 7.8 | 7.8 | 4.8 |
| PI 549794 | | | 8.9 | 8.9 | 4.1 |
| Royal Burgundy | | 12.9 | 11.1 | 12.0 | 4.8 |
| Serene | | 11.6 | 11.7 | 11.7 | 4.1 |
| Trout/Jacobs Cattle | 15.4 | 13.4 | 12.3 | 13.7 | 4.1 |
| W 614717 | | | 12.9 | 12.9 | 6.0 |
| W 614732 | | | 9.8 | 9.8 | 3.8 |
| W 614734 | | | 11.2 | 11.2 | 4.7 |
| Pole | 15.6 | 16.6 | | 15.8 | |
| Kentucky Wonder | 15 | | | 15.0 | |
| Painted Lady | 15.3 | 16.6 | | 16.0 | |
| Scarlet Emperor | 16.4 | | | 16.4 | |
| Adzuki | | 9.7 | 9.0 | 9.4 | 6.1 |
| Beni Dainagon | | 9.8 | 9.2 | 9.5 | 5.6 |
| Erimo | | 9.3 | 8.8 | 9.1 | 5.9 |
| Takara | | 9.9 | 9 | 9.5 | 6.9 |
| WAA 2201(Crimson) | | 9.8 | 9 | 9.4 | 5.9 |
| Mean | 12 | 10.8 | 10.1 | | 4.5 |
| P Value | N/A | 0.0000 | 0.0000 | | 0.0000 |

Table 7. Total pod weight (g), pod length and width (cm), stringiness and taste of pods raw and cooked of 10 tender green pods per variety at VREC 2003

| Variety | 10 tender green beans | | | | Taste of pods | |
|-----------------------|-----------------------|------------|------------|-------------|---------------|----------------------|
| | T Wt (g) | T lth (cm) | T Wth (cm) | Stringiness | Raw | Cooked |
| Brown Dutch | 36.7 | 90.3 | 13.3 | Y | Fair | Good |
| G-18689 | 30.8 | 91.5 | 9.6 | N | Good | Good |
| Great Northern White | 47.6 | 101.8 | 11.0 | Y | Fair | Good but waxy |
| H 9673 | 35.8 | 90.4 | 11.0 | Y | Tough | Good, slightly tough |
| ICB-10 | 41.9 | 94.5 | 12.0 | Y | Tough | V. good, good flavor |
| Magpie | 40.1 | 120.5 | 10.2 | N | Good | V. good |
| Midnight Black Turtle | 27.3 | 79.0 | 10.4 | Y | Fair | Fair, mild flavor |
| Navy Pea | 34.2 | 90.5 | 10.6 | Y | Good | Good |
| W 614724 | 35.5 | 100.7 | 10.4 | Y | Tough | Good, mild flavor |
| W 614731 | 36.9 | 100.4 | 10.5 | N | Good | V. good. |
| Average | 36.7 | 96.0 | 10.9 | | | |