# 2012 RESEARCH REPORT

# SAGINAW VALLEY

# RESEARCH & EXTENSION CENTER
and
# RELATED BEAN - BEET RESEARCH

## MICHIGAN STATE UNIVERSITY

## **AgBioRESEARCH**

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# SAGINAW VALLEY RESEARCH AND EXTENSION CENTER REPORT

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## INTRODUCTION

The Michigan sugar beet grower cooperative, Michigan Sugar Company, and the Michigan dry bean growers and industry represented by the Michigan Bean Commission and Michigan Bean Shippers Association, donated the proceeds of the 120 acre Saginaw Valley Bean and Beet Research Farm, located in Saginaw County for 38 years, to Michigan State University in 2009. The Michigan State University Office of Land Management then purchased and operates a 320 acre farm near Richville Michigan in Denmark Township. The site is being established as an AgBioResearch research center. Shop, offices and machinery storage have been built, infrastructure improvements including electricity, phone, wireless internet, irrigation and municipal water were established. Future infrastructure plans include fiber optic internet connection and natural gas hookup. The site is located on the southeast corner of Reese and Krueger Roads, address of 3775 South Reese Road, Frankenmuth, Michigan 48734.

Field research was initiated in 2009 and the 2012 season was the Fourth season of research at the site. This research report is primarily a compilation of research conducted at the site in 2012. Most of the work represents one year's results, and even though multi-season results are included, **this work should be considered a progress report.**

**Soil –** The soil type on the farm is classified as a Tappan-Londo loam, these are very similar soil types separated by subsoil drainage classifications, the Tappan not being as naturally well drained as the Londo. The site was soil tested in spring 2009 at 2.5 acre increments. The soil pH averages 7.9, soil test phosphorus averages 56 pounds P/acre, soil test Potassium averages 294 pounds K/acre.

**Weather –** The monthly rainfall for 2012 collected with the automated rain gauge is given in Table 1. The monthly totals are given at the bottom of the table. June and July were dry, with beneficial rain coming in late July. Wheat yielded 90 bushels/acre, dry beans would not flower well in the dry and the heat and flowered after the July rain and were delayed in maturity but still yielded 20-30 cwt/acre. Earlier planted corn pollinated during the dry hot spell yielded 20-40 bushels less than the 170 bushels/acre later planted corn. Soybean and sugarbeet yields were very good at 65 bushels/acre and 30 tons/acre, they did well with the early and late rains. The rainfall total of 25.57 was lower than average. Maximum and minimum daily temperatures along with growing degree days (base 50) are given in Table 2. The 2012 season was warm with 12 days above 90 degrees and 42 days above 85 degrees including one 86 degree day in March which lead to the demise of the local fruit crop. There was 2637 growing degree days for 2012 which was above average.

## MONTHLY PRECIPITATION, SAGINAW VALLEY RESEARCH FARM

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | 1.00 | 0.71 | 1.84 | 3.91 | 2.60 | 4.04 | 5.90 | 2.11 | 4.61 | 3.26 | 0.94 | 2.44 | 33.36 |
| 1981 | 0.29 | 1.73 | 0.53 | 3.43 | 3.52 | 3.09 | 2.41 | 3.83 | 9.09 | 2.74 | 2.21 | 0.68 | 33.56 |
| 1982 | 2.37 | 0.46 | 2.26 | 1.27 | 3.32 | 3.09 | 2.65 | 2.55 | 3.02 | 0.76 | 4.01 | 3.26 | 29.02 |
| 1983 | 0.89 | 0.90 | 3.29 | 4.55 | 6.15 | 3.55 | 1.91 | 2.50 | 5.11 | 2.95 | 3.06 | 2.00 | 36.86 |
| 1984 | 0.56 | 0.73 | 3.18 | 3.20 | 3.66 | 3.94 | 2.42 | 3.75 | 3.29 | 3.05 | 2.67 | 2.18 | 32.63 |
| 1985 | 1.85 | 2.12 | 4.08 | 3.96 | 2.30 | 1.87 | 2.38 | 7.02 | 4.38 | 3.08 | 4.66 | 1.05 | 38.75 |
| 1986 | 1.34 | 2.24 | 1.62 | 1.87 | 3.10 | 3.48 | 1.38 | 2.76 | 18.05 | 2.64 | 0.75 | 1.38 | 40.61 |
| 1987 | 1.11 | 0.82 | 1.03 | 2.03 | 0.67 | 4.11 | 1.35 | 3.92 | 5.03 | 1.88 | 2.13 | 2.63 | 26.71 |
| 1988 | 1.04 | 1.01 | 1.70 | 3.26 | 0.56 | 0.59 | 3.45 | 3.52 | 2.46 | 3.25 | 4.36 | 1.08 | 26.28 |
| 1989 | 1.09 | 0.34 | 1.40 | 2.05 | 5.03 | 6.25 | 1.06 | 2.92 | 4.43 | 1.72 | 3.24 | 0.48 | 30.01 |
| 1990 | 1.23 | 1.21 | 1.17 | 1.54 | 2.81 | 2.07 | 2.53 | 6.94 | 3.74 | 5.87 | 4.51 | 1.45 | 35.12 |
| 1991 | 0.85 | 0.60 | 3.68 | 6.61 | 3.71 | 2.66 | 4.53 | 2.61 | 1.50 | 3.52 | 2.04 | 1.24 | 31.58 |
| 1992 | 1.20 | 1.65 | 1.31 | 4.56 | 1.10 | 2.10 | 4.33 | 2.92 | 4.08 | 2.54 | 4.50 | 2.10 | 32.39 |
| 1993 | 2.72 | 0.47 | 0.87 | 4.08 | 2.76 | 3.03 | 2.46 | 4.62 | 4.00 | 3.70 | 1.99 | 0.53 | 31.23 |
| 1994 | 0.55 | 0.66 | 0.91 | 3.58 | 2.04 | 6.99 | 2.57 | 4.44 | 2.19 | 2.24 | 4.40 | 1.03 | 31.60 |
| 1995 | 1.67 | 0.35 | 1.38 | 2.72 | 1.44 | 1.96 | 1.29 | 5.00 | 1.33 | 2.39 | 4.05 | 0.79 | 24.37 |
| 1996 | 0.83 | 0.94 | 0.49 | 3.18 | 5.47 | 5.65 | 2.32 | 1.53 | 3.52 | 3.31 | 1.37 | 2.21 | 30.82 |
| 1997 | 1.51 | 4.25 | 1.32 | 1.38 | 3.00 | 0.69 | 2.44 | 3.61 | 3.46 | 1.31 | 1.03 | 0.36 | 24.36 |
| 1998 | 2.66 | 2.05 | 3.17 | 2.14 | 1.87 | 1.56 | 1.02 | 2.01 | 1.41 | 3.18 | 1.79 | 1.32 | 24.18 |
| 1999 | 2.75 | 0.41 | 0.62 | 5.01 | 2.33 | 3.07 | 5.02 | 3.01 | 2.52 | 1.12 | 1.04 | 1.90 | 28.80 |
| 2000 | 0.57 | 1.35 | 0.89 | 2.94 | 5.34 | 2.65 | 3.03 | 3.69 | 3.27 | 0.90 | 2.07 | 1.57 | 28.27 |
| 2001 | 0.33 | 3.16 | 0.11 | 2.38 | 4.42 | 2.45 | 0.53 | 3.52 | 4.34 | 4.90 | 1.76 | 1.61 | 29.51 |
| 2002 | 1.02 | 1.49 | 2.47 | 3.49 | 4.46 | 3.15 | 3.00 | 4.50 | 0.50 | 1.87 | 1.19 | 0.97 | 28.11 |
| 2003 | 0.27 | 0.21 | 1.66 | 0.36 | 4.19 | 2.04 | 2.49 | 1.33 | 1.99 | 1.09 | 5.35 | 1.20 | 22.18 |
| 2004 | 1.09 | 0.55 | 2.50 | 1.31 | 7.34 | 2.70 | 2.01 | 2.32 | 0.66 | 2.41 | 3.44 | 1.51 | 27.84 |
| 2005 | 2.90 | 0.71 | 0.62 | 1.32 | 1.74 | 4.97 | 3.20 | 0.72 | 0.72 | 1.30 | 3.83 | 1.49 | 23.52 |
| 2006 | 1.91 | 1.57 | 1.59 | 1.87 | 4.17 | 2.03 | 5.72 | 2.61 | 2.53 | 3.77 | 3.05 | 2.81 | 33.63 |
| 2007 | 1.11 | 0.35 | 1.27 | 3.02 | 2..20 | 1.06 | 2.59 | 4.80 | 2.64 | 2.86 | 0.89 | 1.93 | 22.52 |
| 2008 | 1.76 | 2.59 | 1.23 | 1.99 | 1.13 | 3.88 | 3.94 | 2.10 | 5.61 | 1.70 | 1.36 | 1.21 | 28.50 |
| *2009 | 0.01 | 2.12 | 1.84 | 4.69 | 1.23 | 4.81 | 2.73 | 3.48 | 0.82 | 3.61 | 0.47 | 1.88 | 27.69 |
| 2010 | 0.14 | 0.20 | 0.40 | 2.15 | 3.36 | 2.71 | 0.89 | 1.27 | 3.11 | 1.94 | 1.97 | 0.42 | 18.56 |
| 2011 | 0.48 | 0.24 | 1.82 | 4.96 | 3.86 | 1.51 | 1.34 | 2.98 | 2.28 | 2.85 | 2.74 | 1.42 | 26.48 |
| 2012 | 1.86 | 0.76 | 1.41 | 1.19 | 3.92 | 1.10 | 3.62 | 4.03 | 1.60 | 4.29 | 0.38 | 1.41 | 25.57 |
| AVG. | 1.18 | 1.16 | 1.58 | 2.87 | 2.99 | 2.96 | 2.57 | 3.18 | 3.51 | 2.54 | 2.51 | 1.46 | 28.51 |

**Station moved from Saginaw, MI to Richville, MI*

# PRECIPITATION - SAGINAW VALLEY RESEARCH & EXTENSION CENTER- 2012

| Day: | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.6 | | | | | 0.68 | | | | | | |
| 2 | | | 0.36 | | 0.05 | 0.20 | | 0.01 | | | | 0.36 |
| 3 | | | | | 1.48 | | 0.58 | | | 0.02 | | |
| 4 | | | | | 0.05 | | | 0.01 | 0.39 | 0.21 | | 0.01 |
| 5 | | | | | | | 0.03 | 0.36 | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 0.07 | | | | 0.34 | | | 0.06 |
| 8 | | | 0.13 | | | | | | 0.13 | | | 0.21 |
| 9 | | | | | 0.01 | | | 0.71 | | | | 0.01 |
| 10 | | | | | | | | 2.30 | | 0.13 | | 0.06 |
| 11 | | | | | | | | 0.09 | | 0.10 | | 0.01 |
| 12 | 0.28 | | 0.63 | | 0.33 | 0.02 | | | | | 0.32 | |
| 13 | | | 0.01 | | 0.02 | | 0.03 | 0.01 | 0.10 | 0.40 | | |
| 14 | | 0.01 | | | | | 0.06 | 0.02 | 0.29 | 0.77 | | |
| 15 | | 0.07 | | 0.28 | 0.16 | | | | | | | 0.08 |
| 16 | 0.06 | 0.16 | | 0.24 | 0.08 | | 0.14 | 0.03 | | | | 0.03 |
| 17 | 0.24 | | | | | | | | | 0.02 | | |
| 18 | | | | | | 0.05 | 0.49 | | 0.07 | 0.35 | | |
| 19 | | 0.03 | | 0.02 | | | | 0.4 | | 0.06 | | |
| 20 | | | | 0.44 | | | | | 0.20 | 0.37 | | 0.50 |
| 21 | 0.06 | 0.03 | | | 0.02 | 0.01 | | | 0.08 | | | 0.01 |
| 22 | | | | | | 0.14 | | | | 0.12 | 0.04 | 0.02 |
| 23 | 0.32 | 0.03 | 0.01 | | | | 0.05 | | | 1.11 | | 0.01 |
| 24 | | 0.23 | 0.02 | | | | | | | | | |
| 25 | | | | | | | 0.03 | | | | | |
| 26 | 0.12 | | | | 0.08 | | 1.51 | 0.04 | | 0.07 | | |
| 27 | 0.16 | | | | 1.54 | | 0.47 | 0.05 | | | | 0.04 |
| 28 | 0.02 | | | | | | | | | | | |
| 29 | | 0.20 | | | 0.01 | | | | | | | |
| 30 | | | 0.25 | 0.21 | | | | | | 0.52 | 0.02 | |
| 31 | | | | | 0.02 | | 0.23 | | | 0.04 | | |
| TOTAL | 1.86 | 0.76 | 1.41 | 1.19 | 3.92 | 1.10 | 3.62 | 4.03 | 1.60 | 4.29 | 0.38 | 1.41 |

Rainfall is measured in inches

2012 YEAR END TOTAL: 25.57 INCHES

MAXIMUM-MINIMUM AIR TEMPERATURES (F)

SAGINAW VALLEY RESEARCH & EXTENSION CENTER - 2012

| | JANUARY | | FEBRUARY | | MARCH | | APRIL | | MAY | | JUNE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 44 | 29 | 47 | 33 | 38 | 32 | 50 | 36 | 55 | 45 | 53 | 46 |
| 2 | 29 | 18 | 36 | 28 | 46 | 33 | 56 | 27 | 81 | 46 | 67 | 45 |
| 3 | 21 | 14 | 36 | 28 | 39 | 24 | 59 | 34 | 85 | 54 | 74 | 52 |
| 4 | 34 | 19 | 41 | 24 | 27 | 19 | 57 | 31 | 66 | 49 | 69 | 46 |
| 5 | 38 | 24 | 38 | 22 | 28 | 13 | 46 | 28 | 60 | 44 | 70 | 48 |
| 6 | 52 | 36 | 44 | 28 | 53 | 25 | 54 | 22 | 69 | 41 | 76 | 45 |
| 7 | 42 | 30 | 33 | 20 | 65 | 47 | 64 | 26 | 58 | 51 | 79 | 50 |
| 8 | 36 | 24 | 33 | 15 | 60 | 28 | 59 | 43 | 71 | 51 | 82 | 52 |
| 9 | 39 | 25 | 39 | 22 | 34 | 18 | 59 | 31 | 62 | 45 | 87 | 65 |
| 10 | 44 | 25 | 31 | 12 | 48 | 17 | 45 | 33 | 65 | 36 | 90 | 60 |
| 11 | 49 | 27 | 19 | 5 | 66 | 40 | 55 | 32 | 74 | 40 | 80 | 63 |
| 12 | 37 | 31 | 28 | 15 | 62 | 40 | 56 | 25 | 63 | 55 | 75 | 54 |
| 13 | 31 | 18 | 34 | 18 | 61 | 40 | 64 | 28 | 71 | 47 | 71 | 43 |
| 14 | 18 | 0 | 32 | 23 | 75 | 33 | 68 | 44 | 76 | 43 | 80 | 42 |
| 15 | 24 | -1 | 41 | 31 | 76 | 56 | 73 | 54 | 82 | 48 | 87 | 51 |
| 16 | 39 | 18 | 39 | 31 | 72 | 42 | 68 | 40 | 63 | 45 | 87 | 61 |
| 17 | 36 | 20 | 41 | 30 | 79 | 52 | 51 | 34 | 66 | 36 | 81 | 63 |
| 18 | 22 | 18 | 31 | 19 | 73 | 50 | 63 | 28 | 78 | 46 | 84 | 56 |
| 19 | 26 | 4 | 29 | 11 | 79 | 49 | 65 | 42 | 87 | 49 | 92 | 76 |
| 20 | 15 | 0 | 39 | 14 | 82 | 57 | 50 | 37 | 89 | 56 | 92 | 71 |
| 21 | 26 | 0 | 37 | 27 | 86 | 55 | 47 | 31 | 72 | 56 | 88 | 65 |
| 22 | 35 | 7 | 41 | 28 | 77 | 53 | 51 | 30 | 70 | 52 | 79 | 58 |
| 23 | 47 | 31 | 38 | 24 | 66 | 48 | 56 | 37 | 77 | 42 | 81 | 54 |
| 24 | 31 | 28 | 32 | 27 | 57 | 46 | 58 | 37 | 85 | 55 | 84 | 64 |
| 25 | 30 | 27 | 30 | 19 | 68 | 41 | 62 | 31 | 82 | 61 | 72 | 53 |
| 26 | 36 | 25 | 34 | 11 | 41 | 27 | 53 | 36 | 76 | 59 | 81 | 49 |
| 27 | 38 | 31 | 38 | 20 | 54 | 21 | 54 | 26 | 75 | 56 | 88 | 53 |
| 28 | 33 | 26 | 39 | 14 | 59 | 38 | 49 | 30 | 89 | 64 | 96 | 66 |
| 29 | 28 | 20 | 37 | 30 | 39 | 29 | 64 | 22 | 80 | 58 | 92 | 65 |
| 30 | 33 | 14 | | | 35 | 24 | 52 | 41 | 66 | 51 | 93 | 64 |
| 31 | 54 | 24 | | | 43 | 31 | | | 61 | 47 | | |

## Growing Degree Days

Base 50 (max + min / 2 - 50)

| | Apr | May | Jun | Jul | Aug | Sep | Oct | **Total** |
|---|---|---|---|---|---|---|---|---|
| 2009 | 50.5 | 190.0 | 432.0 | 458.5 | 517.5 | 345.0 | 27.0 | 2020.5 |
| 2010 | 89.0 | 385.0 | 528.5 | 729.0 | 697.5 | 311.5 | 95.0 | 2835.5 |
| 2011 | 38.0 | 273.0 | 515.0 | 758.5 | 576.5 | 308.5 | 122.5 | 2592.0 |
| 2012 | 28.0 | 341.0 | 555.5 | 756.0 | 552.0 | 295.0 | 109.50 | 2637.0 |

MAXIMUM-MINIMUM AIR TEMPERATURES (F)

SAGINAW VALLEY RESEARCH & EXTENSION CENTER - 2012 cont.

| | JULY | | AUGUST | | SEPTEMBER | | OCTOBER | | NOVEMBER | | DECEMBER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN |
| 1 | 89 | 62 | 82 | 58 | 79 | 54 | 66 | 35 | 48 | 37 | 55 | 29 |
| 2 | 95 | 59 | 81 | 61 | 83 | 55 | 69 | 49 | 40 | 33 | 55 | 43 |
| 3 | 90 | 67 | 91 | 66 | 86 | 54 | 61 | 54 | 37 | 26 | 61 | 36 |
| 4 | 96 | 71 | 88 | 65 | 81 | 64 | 76 | 57 | 38 | 24 | 62 | 35 |
| 5 | 91 | 71 | 82 | 58 | 82 | 61 | 61 | 45 | 39 | 24 | 37 | 24 |
| 6 | 96 | 71 | 79 | 51 | 81 | 55 | 51 | 33 | 42 | 30 | 37 | 24 |
| 7 | 83 | 66 | 84 | 55 | 73 | 56 | 50 | 32 | 47 | 24 | 43 | 36 |
| 8 | 80 | 59 | 81 | 58 | 70 | 52 | 56 | 28 | 45 | 21 | 37 | 30 |
| 9 | 85 | 57 | 68 | 59 | 69 | 44 | 63 | 35 | 51 | 31 | 33 | 29 |
| 10 | 80 | 53 | 63 | 58 | 72 | 43 | 55 | 32 | 55 | 42 | 32 | 25 |
| 11 | 84 | 53 | 69 | 58 | 79 | 47 | 62 | 29 | 68 | 54 | 32 | 21 |
| 12 | 88 | 55 | 77 | 56 | 83 | 56 | 51 | 28 | 62 | 28 | 42 | 29 |
| 13 | 93 | 58 | 73 | 59 | 81 | 56 | 58 | 29 | 37 | 25 | 45 | 29 |
| 14 | 91 | 63 | 77 | 60 | 70 | 48 | 69 | 54 | 37 | 20 | 43 | 28 |
| 15 | 91 | 69 | 78 | 57 | 71 | 43 | 54 | 44 | 44 | 25 | 41 | 28 |
| 16 | 93 | 64 | 78 | 59 | 77 | 49 | 58 | 32 | 49 | 23 | 49 | 39 |
| 17 | 99 | 71 | 73 | 49 | 77 | 50 | 73 | 49 | 53 | 27 | 41 | 35 |
| 18 | 82 | 69 | 73 | 45 | 63 | 40 | 58 | 46 | 53 | 31 | 40 | 30 |
| 19 | 70 | 63 | 75 | 48 | 65 | 34 | 55 | 43 | 54 | 27 | 40 | 29 |
| 20 | 77 | 59 | 73 | 49 | 68 | 48 | 54 | 41 | 50 | 33 | 44 | 30 |
| 21 | 86 | 54 | 76 | 48 | 67 | 45 | 60 | 36 | 56 | 31 | 39 | 25 |
| 22 | 90 | 65 | 78 | 52 | 59 | 41 | 71 | 40 | 62 | 41 | 61 | 27 |
| 23 | 94 | 71 | 84 | 52 | 57 | 36 | 59 | 54 | 53 | 30 | 61 | 18 |
| 24 | 80 | 59 | 86 | 59 | 63 | 35 | 76 | 56 | 32 | 27 | 27 | 19 |
| 25 | 89 | 54 | 89 | 59 | 74 | 50 | 76 | 57 | 32 | 24 | 30 | 23 |
| 26 | 84 | 66 | 89 | 63 | 66 | 44 | 68 | 40 | 31 | 25 | 28 | 26 |
| 27 | 76 | 65 | 84 | 63 | 65 | 37 | 52 | 30 | 33 | 17 | 28 | 10 |
| 28 | 78 | 61 | 76 | 55 | 68 | 43 | 47 | 32 | 38 | 21 | 27 | 5 |
| 29 | 82 | 55 | 78 | 49 | 69 | 41 | 43 | 38 | 46 | 22 | 28 | 15 |
| 30 | 86 | 59 | 83 | 54 | 63 | 38 | 39 | 33 | 36 | 30 | 28 | 14 |
| 31 | 82 | 63 | 90 | 63 | | | 42 | 34 | | | 33 | 21 |

## GROWING DEGREE DAYS - SAGINAW VALLEY RESEARCH FARM

Base 50 (max + min / 2 - 50)

| | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1976 | 113.00 | 151.50 | 537.50 | 596.00 | 500.50 | 276.50 | 72.00 | 2247.00 |
| 1977 | 140.50 | 398.00 | 389.00 | 675.00 | 485.00 | 344.00 | 43.00 | 2474.50 |
| 1978 | 4.00 | 316.50 | 474.50 | 571.50 | 588.50 | 393.50 | 75.00 | 2423.50 |
| 1979 | 47.50 | 228.50 | 458.50 | 577.50 | 479.00 | 330.00 | 116.00 | 2237.00 |
| 1980 | 34.00 | 281.50 | 369.00 | 617.50 | 606.00 | 317.50 | 33.50 | 2259.00 |
| 1981 | 55.50 | 187.00 | 491.00 | 579.50 | 312.00 | 265.00 | 13.50 | 1903.50 |
| 1982 | 54.50 | 428.50 | 365.50 | 626.00 | 476.00 | 298.00 | 156.00 | 2404.50 |
| 1983 | 16.00 | 118.50 | 491.00 | 716.00 | 645.00 | 369.50 | 97.00 | 2453.00 |
| 1984 | 67.50 | 164.50 | 506.00 | 558.50 | 627.00 | 282.00 | 114.50 | 2320.00 |
| 1985 | 183.50 | 306.00 | 388.00 | 603.50 | 523.00 | 394.50 | 100.00 | 2498.50 |
| 1986 | 124.50 | 310.00 | 435.00 | 664.00 | 459.50 | 370.00 | 96.50 | 2459.50 |
| 1987 | 84.00 | 336.50 | 566.50 | 725.50 | 537.50 | 334.00 | 19.50 | 2603.50 |
| 1988 | 35.50 | 290.50 | 544.50 | 739.50 | 667.50 | 283.00 | 48.00 | 2608.50 |
| 1989 | 21.50 | 202.00 | 456.50 | 648.00 | 535.00 | 315.00 | 167.00 | 2345.00 |
| 1990 | 165.50 | 146.00 | 493.50 | 587.50 | 553.50 | 332.50 | 100.50 | 2379.00 |
| 1991 | 144.00 | 423.50 | 541.00 | 641.00 | 567.50 | 289.50 | 114.00 | 2720.50 |
| 1992 | 56.00 | 241.50 | 367.00 | 446.50 | 403.50 | 257.50 | 41.50 | 1813.50 |
| 1993 | 23.50 | 208.00 | 430.00 | 642.00 | 613.50 | 184.50 | 25.00 | 2126.50 |
| 1994 | 95.50 | 227.50 | 526.50 | 613.50 | 501.50 | 380.00 | 115.00 | 2459.50 |
| 1995 | 3.00 | 221.00 | 536.00 | 698.50 | 745.00 | 225.00 | 125.50 | 2554.00 |
| 1996 | 41.00 | 157.00 | 486.00 | 572.00 | 611.00 | 357.50 | 91.50 | 2316.00 |
| 1997 | 27.00 | 48.00 | 534.00 | 596.50 | 443.00 | 299.50 | 134.50 | 2082.50 |
| 1998 | 46.00 | 267.00 | 505.50 | 623.50 | 648.00 | 456.00 | 114.00 | 2660.00 |
| 1999 | 49.50 | 299.00 | 578.50 | 684.50 | 500.00 | 339.00 | 67.50 | 2518.00 |
| 2000 | 17.00 | 284.00 | 474.50 | 509.50 | 544.50 | 289.00 | 157.00 | 2275.50 |
| 2001 | 78.00 | 289.50 | 504.00 | 649.50 | 654.00 | 282.00 | 114.00 | 2571.00 |
| 2002 | 123.00 | 141.50 | 535.00 | 710.00 | 575.00 | 443.00 | 99.00 | 2626.50 |
| 2003 | 66.50 | 147.50 | 410.00 | 606.00 | 608.00 | 312.50 | 82.00 | 2232.50 |
| 2004 | 89.00 | 240.50 | 429.50 | 561.00 | 450.50 | 421.50 | 69.00 | 2261.00 |
| 2005 | 58.00 | 145.00 | 623.00 | 647.50 | 611.50 | 429.00 | 130.00 | 2644.00 |
| 2006 | 79.00 | 283.50 | 470.50 | 661.00 | 555.50 | 260.00 | 38.50 | 2348.00 |
| 2007 | 53.50 | 277.00 | 534.00 | 564.00 | 594.00 | 393.00 | 231.00 | 2646.50 |
| 2008 | 110.00 | 116.50 | 512.00 | 620.00 | 532.50 | 343.00 | 56.50 | 2290.50 |
| *2009 | 50.50 | 190.00 | 432.00 | 458.50 | 517.50 | 345.00 | 27.00 | 2020.50 |
| 2010 | 89.00 | 368.50 | 528.50 | 729.00 | 697.50 | 311.50 | 95.00 | 2819.00 |
| 2011 | 38.00 | 273.00 | 515.00 | 758.50 | 576.50 | 308.50 | 122.50 | 2592.00 |
| 2012 | 28.00 | 341.00 | 555.50 | 756.00 | 552.00 | 295.00 | 109.50 | 2637.00 |
| AVERAGE | 67.89 | 244.74 | 486.32 | 627.95 | 553.97 | 327.74 | 92.20 | 2400.82 |

* Station moved to from Saginaw, MI to Richville, MI

**Saginaw Valley Research Farm Report, 2012 Field season**
PI: Chris DiFonzo, Department of Entomology

## Western bean cutworm biology and life history

*How do different types of Bt compare in ear damage under low WBC infestation, and does spraying a Bt hybrid improve yield?*

- *There was no difference among Bt hybrids in WBC damage in 2012, because WBC populations were so low. Sprayed plots yielded more.*

From previous efficacy trials, we knew that WBC control differed by type of Bt corn. In 2012, we planted three different hybrids: Genuity Double Pro with Cry1A.105/ Cry2Ab2, Optimum Acremax with Cry1F, and Agrisure Viptera with the VIP protein. Cry1A.105/Cry2Ab2 has little or no impact on WBC, Cry1F gives partial control, and VIP provides excellent control. Two studies were planted, one under high WBC pressure (Montcalm) and another in an area with no history of WBC infestation (Saginaw Farm). I report the Saginaw results here. Plots were 8-rows x 30 feet; four rows of each plot were sprayed three times with Asana or Warrior to provide an insect-free check. Ear damage and yield were assessed at the end of the season, separately for the sprayed and untreated rows of each plot. Yield comparisons were made between sprayed versus unsprayed rows in each hybrid. Yield was not compared across hybrids because they were from different companies and had different base genetics.

As expected, no WBC feeding was found in Saginaw. However, plots sprayed three times had higher yield than unsprayed plots, significantly so (12 bushels) with Acremax. This increase was surprising, as there were no obvious pest populations present during the season. Despite the yield increase, assuming the cost of three sprays, spraying would not have been profitable except in the AcreMax treatment. We do not know if a single application would have achieved the same results.

| | *Genuity* | *Acremax* | *Viptera* |
|---|---|---|---|
| Bt toxin(s) | Cry1A.105, Cry2Ab2 | Cry1F | VIP protein |
| Bt efficacy | poor/none | good | excellent |
| Sprayed with Warrior | 156 bu | 198 bu | 140 bu |
| Not treated | 149 bu | 186 bu | 133 bu |
| Difference w/ spray | +7 bu ns | +12 bu* | +7 bu ns |

*Do WBC larvae overwinter deeper, and thus better, in sandy soils?*

- *Answer: It appears so, but it is difficult to prove.*

In July 2011, we filled long (18-inch deep) buckets with a McBride/Isabella sandy loam soil from Montcalm County (a center of WBC infestation), and a heavier Tappan Londo loam soil from the Saginaw Valley Farm (where WBC moths and damage are uncommon). The pre-marked 20-inch pots were sunk into the ground in July using a tractor-mounted auger. Pots were in place all summer to develop a soil profile. Pots were infested with 10 larvae each in

September 2011, and dug up in the winter of 2012 to recover WBC prepupae. A greater proportion of prepupae were recovered deeper in the sandy loam soil, the deepest at 16 inches. However, overall recovery was low in winter 2012, we speculate because the soil profile never froze. The insects likely used up their fat stores well before the spring, and died in mid-winter. We reset buckets in July 2012 using the same soil types and infested them in August. These buckets are still in the field, and we will dig them up in early 2013.

| | *% of prepupae recovered, by depth* | | | | |
|---|---|---|---|---|---|
| Soil source | *1-4 inches* | *5-8 inches* | *9-12 inches* | *13-16 inches* | *17-20 inches* |
| Saginaw | 0% | 39% | 52% | 9% | 0% |
| Montcalm | 3% | 12% | 64% | 21% | 0% |

*How long does pyrethroid residue last on dry beans to kill WBC larvae?*

- *Answer: At least 14 days*

For the last three seasons, MSU recommended that dry bean growers spray fields with a pyrethroid within two weeks of peak trap catch. Growers asked how long pyrethroid spray residues were effective. In 2012, we sprayed blocks of dry bean plants with Warrior 1, 5, 7, or 14 days prior to a feeding trial. Before spraying, exposed leaves were marked to ensure collecting plant material with Warrior residue. These leaves were collected on the day of the study, leaf disks cut out, and disks put into cups in the lab. A small WBC larva ($2^{nd}$ or $3^{rd}$ instar) was placed in each cup to crawl over or feed on the leaf material, and survival was recorded at 48 hours. The study was repeated a week later with new leaves. Warrior residue on leaves killed 100% of larvae even 14 days after spraying. Given good spray coverage, there is at least a 2 week control (kill) window between treatment and egg hatch for WBC on dry beans.

| | *% dead after 48 hrs* | |
|---|---|---|
| *Treatment* | *Trial 1* | *Trial 2* |
| Not sprayed | 6% | 12% |
| 1 Day after spray | 100% | 100% |
| 5 Days after spray | 100% | 100% |
| 7 Days after spray | 81% | 100% |
| 14 Days after spray | 100% | 100% |

# Michigan Sugar Company Research

Official Variety Trial: This trial was planted at eight locations and six were usable for the variety approval process.

Purpose: To evaluate the production differences in varieties. Tons per acre, sugar content, and purity are measured and used to figure Recoverable Sugar per Ton (RWST) and Sugar per Acre (RWSA).

Results: Results were good from the locations we used. The traits for tons per acre, sugar content and tolerance to diseases and pests vary between varieties. The Official Variety Trials and the nurseries evaluate these differences. The results from our trials provide the information needed to approve the best varieties to be sold and give the growers the information they need to select the best varieties for their farm.

Rhizoctonia Nursery: We planted two locations and both were usable giving good results.

Purpose: The Rhizoctonia nursery is conducted to evaluate resistance in the varieties. The test is inoculated. Knowledge of varietal differences is important to help the growers select the best varieties for their conditions.

Results: There are a few varieties containing a level of tolerance to Rhizoctonia and many that have very little or no tolerance to the disease.

Cercospora Leafspot Nursery:

This nursery was planted at four locations and two gave us good results.

Purpose: The Cercospora Leafspot nursery is conducted to evaluate resistance in the varieties. These are two row plots with a susceptible variety planted between plots which helps spread the disease evenly. The entire plot area is inoculated with Cercospora.

Results: The results of this nursery indicates which varieties have a level of resistance that is acceptable in our growing region. The most tolerant variety had a rating of 2.5 and the most susceptible variety had a rating of 5.2 on a scale of 0-9.

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# Official Variety Trials

## Average of 6 Locations - 2012

Sorted by **$/Acre**

| Variety | $/A | RWSA | RWST Actual | RWST Rank | Yield T/A | Yield Rank | Sugar % | Sugar Rank | CJP % | CJP Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| C-RR202 | **$2,469** | **10614** | **293** | **1** | 36.2 | 5 | **19.5** | **6** | **95.5** | **12** |
| B-12RR2N | **$2,428** | **10511** | **287** | **12** | **36.5** | **4** | 19.0 | 19 | **95.7** | **2** |
| B-19RR1N | **$2,419** | **10441** | 283 | 21 | **36.8** | **3** | 18.8 | 24 | **95.6** | **5** |
| C-RR824 | **$2,396** | **10347** | 269 | 38 | **38.4** | **1** | 18.2 | 38 | 95.0 | 31 |
| C-RR059 | **$2,394** | **10353** | **290** | **6** | 35.7 | 11 | **19.4** | **8** | 95.2 | 23 |
| B-18RR4N | **$2,390** | **10313** | **286** | **15** | 36.0 | 6 | 19.1 | 17 | **95.4** | **13** |
| B-12RR40 | **$2,362** | **10193** | 284 | 20 | 35.9 | 9 | 19.1 | 15 | 95.0 | 30 |
| C-RR074NT | **$2,359** | **10161** | 285 | 18 | 35.6 | 12 | 19.2 | 14 | 95.1 | 28 |
| SX-1228RR | **$2,341** | **10098** | 283 | 22 | 35.7 | 10 | 18.8 | 25 | **95.7** | **3** |
| SX-1212RR | **$2,336** | **10159** | 281 | 25 | 36.0 | 8 | 18.7 | 26 | **95.6** | **7** |
| B-12RR6N | **$2,333** | **10056** | 273 | 32 | **36.8** | **2** | 18.4 | 35 | 95.2 | 24 |
| C-RR086 | **$2,325** | **10009** | **290** | **7** | 34.6 | 16 | **19.4** | **9** | 95.2 | 25 |
| B-17RR32 | $2,304 | **9944** | 276 | 30 | 36.0 | 7 | 18.6 | 27 | 94.9 | 33 |
| C-RR288 | $2,268 | 9814 | **286** | **13** | 34.2 | 19 | 19.1 | 16 | **95.5** | **11** |
| C-RR222NT | $2,245 | 9688 | **289** | **9** | 33.5 | 22 | **19.3** | **11** | 95.1 | 26 |
| SX-1291RR | $2,243 | 9663 | 285 | 17 | 33.9 | 21 | 19.2 | 13 | 95.0 | 29 |
| SX-1229RR | $2,239 | 9675 | 285 | 19 | 33.9 | 20 | 18.9 | 21 | **95.6** | **4** |
| M-116 | $2,234 | 9607 | 272 | 35 | 35.4 | 13 | 18.4 | 32 | 94.8 | 37 |
| SX-1281RR | $2,224 | 9607 | 280 | 26 | 34.3 | 18 | 18.9 | 22 | 94.9 | 36 |
| HM-133RR | $2,221 | 9586 | **292** | **3** | 32.8 | 29 | **19.6** | **1** | 94.9 | 34 |
| HM-28RR | $2,215 | 9581 | 277 | 29 | 34.4 | 17 | 18.5 | 29 | **95.4** | **14** |
| HM-50RR | $2,202 | 9490 | **291** | **5** | 32.7 | 31 | **19.5** | **3** | 94.9 | 32 |
| HM-173RR | $2,195 | 9468 | 273 | 33 | 34.7 | 14 | 18.5 | 31 | 94.8 | 39 |
| SX-1226RR | $2,193 | 9489 | **286** | **14** | 33.0 | 27 | 19.0 | 20 | **95.6** | **6** |
| M-206 | $2,192 | 9467 | **287** | **11** | 32.9 | 28 | **19.4** | **10** | 94.8 | 38 |
| SX-1213N RR | $2,168 | 9364 | 269 | 39 | 34.7 | 15 | 18.1 | 40 | **95.4** | **18** |
| C-RR219 | $2,158 | 9288 | **292** | **2** | 31.8 | 35 | **19.5** | **4** | 95.2 | 22 |
| SX-1211N RR | $2,148 | 9261 | 282 | 24 | 32.8 | 30 | 18.8 | 23 | **95.4** | **17** |
| HM-131RR | $2,142 | 9233 | **291** | **4** | 31.7 | 36 | **19.6** | **2** | 94.9 | 35 |
| SX-1260RR | $2,125 | 9187 | 275 | 31 | 33.4 | 24 | 18.4 | 33 | 95.3 | 21 |
| B-10RR34 | $2,117 | 9159 | **286** | **16** | 32.0 | 34 | 19.1 | 18 | **95.4** | **15** |
| HM-NT9403RR | $2,080 | 8978 | 270 | 37 | 33.3 | 25 | 18.4 | 34 | 94.5 | 43 |
| M-NT207 | $2,073 | 8956 | 268 | 41 | 33.5 | 23 | 18.3 | 36 | 94.3 | 44 |
| M-NT208 | $2,064 | 8887 | 283 | 23 | 31.5 | 37 | 19.2 | 12 | 94.5 | 42 |
| HM-NT9425RR | $2,058 | 8841 | **289** | **8** | 30.7 | 42 | **19.5** | **5** | 94.7 | 40 |
| B-12RR89 | $2,056 | 8871 | 273 | 34 | 32.6 | 32 | 18.3 | 37 | 95.3 | 20 |
| HM-27RR | $2,024 | 8785 | 269 | 40 | 32.4 | 33 | 18.0 | 41 | **95.5** | **9** |
| SX-1215RR | $2,021 | 8769 | 279 | 27 | 31.2 | 39 | 18.5 | 28 | **95.7** | **1** |
| HM-9402RR | $2,012 | 8667 | **288** | **10** | 30.1 | 43 | **19.5** | **7** | 94.7 | 41 |
| SX-1227RR | $1,987 | 8585 | 259 | 44 | 33.1 | 26 | 17.5 | 43 | 95.1 | 27 |
| HM-9453RR | $1,984 | 8587 | 278 | 28 | 30.8 | 41 | 18.5 | 30 | **95.5** | **10** |
| HM-9447RR | $1,979 | 8565 | 272 | 36 | 31.4 | 38 | 18.2 | 39 | **95.4** | **16** |
| HM-9401RR | $1,860 | 8038 | 259 | 43 | 31.0 | 40 | 17.4 | 44 | 95.3 | 19 |
| HM-9400RR | $1,782 | 7737 | 265 | 42 | 28.9 | 44 | 17.8 | 42 | **95.6** | **8** |
| Average | 2190 | 9457 | 280 | | 33.7 | | 18.8 | | 95.2 | |
| LSD 5% | 158.8 | 681.1 | 7.1 | | 2.0 | | 0.4 | | 0.3 | |
| CV % | 6.4 | 6.4 | 2.3 | | 5.2 | | 2.1 | | 0.3 | |

**$/A:** Gross dollars per acre assuming $65 payment

**Bold:** Results are not statistically different from top ranking variety in each column

# Cercospora Leafspot Nursery
## Frankenmuth and Richville - 2012
Average of 2 Trials

**Growers:** Saginaw Valley Research Farm and Blumfield Research Center
**Planting Dates:** Richville - April 12, Frankenmuth - May 10
**Inoculation Dates:** Richville - July 2, Frankenmuth - July 11
**Evaluation Period:** Richville - Aug 14 to Sept 14, Frankenmuth - Aug 16 to Sept 9

| Variety | Cerc Rating 0-9 |
|---|---|
| B-12RR89 | 2.5 |
| C-288RR | 2.7 |
| HM-131RR | 2.8 |
| HM-50RR | 2.8 |
| HM-133RR | 2.8 |
| SX-1291RR | 2.9 |
| SX-1281RR | 3.0 |
| M-208NT RR | 3.0 |
| HM-NT9425RR | 3.0 |
| HM-9401RR | 3.1 |
| HM-9402RR | 3.1 |
| SX-1260RR | 3.2 |
| B-10RR34 | 3.4 |
| HM-27RR | 3.4 |
| M-207NT RR | 3.4 |
| SX-1215RR | 3.5 |
| SX-1211N RR | 3.5 |
| SX-1228RR | 3.5 |
| HM-NT9403RR | 3.5 |
| C-202RR | 3.5 |
| SX-1226RR | 3.6 |
| HM-173RR | 3.6 |
| HM-28RR | 3.7 |
| SX-1212RR | 3.7 |

| Variety | Cerc Rating 0-9 |
|---|---|
| SX-1229RR | 3.8 |
| B-18RR4N | 3.9 |
| B-12RR2N | 4.0 |
| C-059RR | 4.1 |
| HM-9400RR | 4.1 |
| C-222NT RR | 4.1 |
| C-086RR | 4.2 |
| C-219RR | 4.2 |
| HM-9447RR | 4.3 |
| C-RR074NT | 4.4 |
| B-19RR1N | 4.4 |
| SX-1227N RR | 4.5 |
| B-12RR6N | 4.5 |
| M-116 | 4.6 |
| B-17RR32 | 4.6 |
| HM-9453RR | 4.7 |
| SX-1213N RR | 4.8 |
| C-824RR | 4.8 |
| B-12RR40 | 4.8 |
| M-206 | 5.2 |
| Average | 3.8 |
| LSD 5% | 0.3 |
| CV % | 6.4 |

**Cercospora 0-9 Rating Scale:**
0 = no spots, 1 = very few spots, 2 = up to 10 spots/leaf, 2.5 = up to 50 spots/leaf, 3 = 100 to 200 spots/leaf (approx. 3% leaf desiccation), 4 = up to 10% leaf desiccation, 5 = up to 25% desiccated, 6 = up to 50% desiccated, 7 = up to 75% desiccated, 8 = up to 90% desiccated, 9 = leaves completely dead.

# Rhizoctonia Nurseries - 2012
## Average of Blumfield, SVRF and USDA

**Trial Quality:** Good
**Location:** Michigan and Ft. Collins, CO
**Plot Size:** 2 Rows x 25 ft, 6 reps
**Inoculation:** Trials were Inoculated

| Variety | Root Rating 0-7 |
|---|---|
| HM-NT9403RR | 3.5 |
| HM-9402RR | 3.5 |
| C-RR086 | 3.5 |
| HM-9400RR | 3.6 |
| HM-50RR | 3.7 |
| HM-133RR | 3.7 |
| HM-173RR | 3.7 |
| HM-NT9425RR | 3.7 |
| M-NT208 | 3.8 |
| HM-27RR | 3.8 |
| C-RR202 | 3.8 |
| HM-9401RR | 3.8 |
| HM-131RR | 3.9 |
| SX-1281RR | 3.9 |
| M-NT207 | 4.0 |
| B-10RR34 | 4.0 |
| B-12RR89 | 4.0 |
| SX-1291RR | 4.0 |
| M-116 | 4.1 |
| SX-1226RR | 4.2 |
| C-RR059 | 4.2 |
| B-12RR2N | 4.3 |
| SX-1227N RR | 4.3 |
| HM-28RR | 4.3 |

| Variety | Root Rating 0-7 |
|---|---|
| B-12RR6N | 4.3 |
| C-RR288 | 4.3 |
| B-12RR40 | 4.4 |
| C-RR219 | 4.5 |
| C-RR222NT | 4.5 |
| SX-1211N RR | 4.5 |
| B-17RR32 | 4.6 |
| B-18RR4N | 4.7 |
| SX-1228RR | 4.7 |
| SX-1212RR | 4.7 |
| SX-1215RR | 4.8 |
| C-RR824 | 4.8 |
| SX-1213N RR | 4.8 |
| B-19RR1N | 4.9 |
| M-206 | 4.9 |
| SX-1260RR | 4.9 |
| HM-9453RR | 4.9 |
| Susc Check | 5.1 |
| SX-1229RR | 5.1 |
| HM-9447RR | 5.1 |
| C-RR074NT | 5.3 |
| Average | 4.3 |
| LSD 5% | 0.7 |
| CV % | 9.8 |

**Disease Index (0-7):**
Rating scale 0 = no disease, 1 = very minor, 2 = minor (<5% rot), 3 = 6 to 25% rot,4 = 26 to 50% rot, 5 = 51 to 75% rot, 6 = 75 to 95% rot and 7 = root completely rotted.

**Sugar beet activities of the USDA-ARS East Lansing conducted in cooperation with Saginaw Research & Extension Center during 2012**

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Evaluation and rating plots were planted at the Saginaw Valley Research & Extension Center in Frankenmuth, MI in 2012 that focused on Cercospora leaf spot performance of a wide range of *Beta vulgaris* materials as well as agronomic performance of sugar beet breeding populations. Leaf spot trials were conducted in conjunction with Beet Sugar Development Foundation (BSDF) and included USDA-ARS cooperator germplasm. Michigan Sugar Cooperative evaluated ARS breeding germplasm using their standard practices. Otherwise, all trials were planted following normal fall and spring tillage operations with a USDA-ARS modified John Deere / Almaco research plot planter. The BSDF evaluation nursery was planted on April 25, 2012, followed by the other evaluation and breeding nurseries on May 10 and 11. A randomized complete-block design with one to four replications was used, depending on the specific test. All plots were 4.5 m (15 ft) long, with 51 cm (20 in) between rows. Azoxystrobin was applied in a band in furrow at planting to control Rhizoctonia damping-off and crown and root rot. All entries in the BSDF Cercospora nursery were RoundUp Ready, thus weeds were controlled with glyphosate in this nursery. For other nurseries, weed seedlings were controlled with two applications of phenmedipham, desmedipham, triflusulfuron methyl and clopyralid (6 June and 15 June) and once with S-metolachlor (29 June), and hand weeding was done to control larger weeds as needed. The beet crop was thinned to stand by hand with the generous help of Michigan Sugar Cooperative. Bolting beets were removed throughout the season.

The official BSDF cooperative Cercospora leaf spot evaluation nursery had entries from two companies, with a total of 198 entries evaluated. This nursery was 2-row, 4 replications conducted in a double-blind fashion. The nursery was inoculated on 7 Jul with a liquid spore suspension of *Cercospora beticola*. Results showed good concordance with results with leaf spot nurseries conducted at other sites across the Midwest, summed over the past three years (i.e. the overall average within a half point on the rating scale). Visual evaluations were taken from plot appearance using a standardized disease index (DI) which has a scale from 0 (no symptoms), 1 (a few scattered spots), 2 (spots coalescing or in large numbers on lower leaves only), 3 (some dieback on lower leaves, but leaves not entirely dead), 4-8 (increasing amounts of dead and diseased tissue), 9 (mostly dead with few remaining living leaves with large dead patches), and 10 (all leaves dead). The high night temperatures in the summer of 2012, combined with high humidity and low rainfall, contributed to a moderate leaf spot epiphytotic. Supplemental moisture was applied using an overhead irrigation system on 13, 16 and 17 Jul. The BeetCast leaf spot advisory in the Frankenmuth area from 1 May to 20 Sep was 185 cumulative daily severity values. The peak of the epidemic occurred around 24 Aug, after which regrowth started to outpace new disease development, thus ratings were discounted after this date.

USDA-ARS cooperator germplasm evaluations included 36 USDA-ARS germplasm entries from Fargo, ND and 215 entries from Ft. Collins, CO, along with 48 open-pollinated entries from the East Lansing program. Mean leaf spot scores by variety in 2012 ranged from 3.0 to 8.0. Results from the 48 East Lansing entries are in Table 1. East Lansing materials were generated from a wide sample of sugar beet germplasm including traditional East Lansing materials with good resistance to Aphanomyces damping-off and Cercospora leaf spot, and smooth root (SR)

genetic backgrounds, as well as newer materials with resistances to nematode, rhizomania, *Rhizoctonia*, and abiotic stress. The range of Cercospora leaf spot reaction values suggest reasonable levels of resistance to Cercospora leaf spot in 21 of the 48 East Lansing entries (e.g. Cercospora rating ≤ 3.0). Check variety scores in this nursery were 2.0 for the resistant germplasm EL50/2 and 3.8 for the susceptible check C869. Michigan Sugar Cooperative obtained agronomic information in Table 1 in a separately managed trial, and their assistance is gratefully acknowledged here. Emergence and stand establishment was poor to fair in these nurseries, due to late planting.

**Table 1:** Cercospora reaction and agronomic values of germplasm releases and potential germplasm releases for open-pollinated USDA-ARS East Lansing germplasm evaluated at the SVREC in 2012 arranged in decreasing order of recoverable white sugar per ton (RWST).

| Accession ID | Identifier | Lineage | Cerc Rating | RWSA | RWST | Tons/A | Sugar | Purity |
|---|---|---|---|---|---|---|---|---|
| EL-A027150 | Group6 - Nema | Nematode group | 3.7 | 5334.6 | 240.2 | 22.0 | 16.9 | 93.3 |
| EL-A027152 | SR100 | (Low water / HS elites) x early nema selns | 3.7 | 5246.8 | 240.1 | 21.8 | 16.9 | 93.3 |
| EL-A024983 | SR99 | (95HS2/sel) x 07-5E | 4.0 | 6118.9 | 239.8 | 25.5 | 17.0 | 93.0 |
| EL-A022776 | EL64, pEL63 | (Salinas nematode x 07-5E/24A)x08-5E | 3.7 | 4191.5 | 237.4 | 17.7 | 16.8 | 93.1 |
| EL-A027007 | EL63 | (Salinas nematode x 07-5E/24A)x08-5E | 4.0 | 5293.2 | 236.0 | 22.4 | 16.9 | 92.7 |
| EL-A024975 | | SR (low water) w/EL | 2.7 | 5684.3 | 235.5 | 24.1 | 16.8 | 92.8 |
| EL-A024969 | SR101 | SR (elites) w/Rhiz | 3.0 | 5961.8 | 234.0 | 25.4 | 16.7 | 92.8 |
| EL-A029769 | EL61 | 2008 Brabrant nematode selections mix | 3.7 | 5040.3 | 234.0 | 21.5 | 16.5 | 93.3 |
| EL-A029002 | storage | Broad mix of roots that stored well | 3.3 | 5457.8 | 233.7 | 23.3 | 16.9 | 92.2 |
| EL-A015030 | SP7322 | Increase of SP6822 (US H20 pollinator) | 2.7 | 3929.8 | 232.2 | 16.8 | 16.4 | 93.4 |
| EL-A029713 | | Nematode (Group 2) | 3.0 | 5036.8 | 231.9 | 21.5 | 16.6 | 92.7 |
| EL-A021740 | EL60 | Rhizoc, rhizomania, Traditional EL, Cerc selections | 3.0 | 5144.8 | 231.6 | 22.2 | 16.6 | 92.5 |
| EL-A029704 | | SR98/2 | 3.0 | 5279.6 | 231.2 | 22.8 | 16.7 | 92.3 |
| EL-A029714 | | Cerc (EL50 et al) & 2010 Cerc EL OP's | 3.0 | 5453.0 | 230.5 | 23.7 | 16.5 | 92.6 |
| EL-A029715 | | SR98/2 & FC mix | 2.7 | 4967.9 | 229.9 | 21.6 | 16.4 | 92.9 |
| EL-A027010 | EL64 | Low water x nematode selections | 3.7 | 5482.6 | 228.4 | 24.6 | 16.3 | 92.3 |
| EL-A024974 | | SR w/EL | 3.0 | 5091.1 | 227.9 | 22.1 | 16.4 | 92.4 |
| EL-A027019 | EL59x | Sclerotuim rolfsii tolerant x 08-5E (nematode) | 3.3 | 5450.6 | 227.2 | 24.1 | 16.3 | 92.6 |
| EL-A027017 | EL65 | Bay City sln x 08-5E (nematode) | 4.3 | 5084.1 | 227.1 | 22.4 | 16.3 | 92.6 |
| EL-A028999 | CRB4 SF mix | CRB4 mixer | 2.7 | 1029.3 | 225.4 | 4.5 | 16.3 | 92.4 |
| EL-A015028 | C869 O-type | C869 O-type | 3.3 | 2812.6 | 224.8 | 12.5 | 16.5 | 91.6 |
| EL-A022775 | EL58 | Bay City sln x 08-5E (nematode) | 4.0 | 5624.6 | 224.6 | 25.0 | 16.2 | 92.5 |
| EL-A022809 | EL57, SF Mixer "B" | self fertile mixer, broad SF base | 4.3 | 4515.0 | 224.3 | 20.1 | 16.2 | 92.5 |
| EL-A029712 | | Nematode (Group 1) | 3.0 | 4621.5 | 223.9 | 20.4 | 16.2 | 92.3 |
| EL-A024978 | | O-type IC | 3.3 | 4954.2 | 223.1 | 22.1 | 16.2 | 92.1 |
| EL-A024972 | | EL w/SR (group 10) | 2.7 | 4817.7 | 222.1 | 21.6 | 16.1 | 92.3 |
| EL-A029768 | EL59 | Sclerotuim rolfsii tolerant x 08-5E (nematode) | 3.7 | 4388.9 | 221.6 | 19.8 | 16.1 | 92.1 |
| EL-A029770 | EL62 | M1-3 nematode | 4.0 | 4232.9 | 221.4 | 19.1 | 16.0 | 92.3 |
| EL-A024973 | | EL w/SR (group 11) | 3.0 | 4834.1 | 221.3 | 22.0 | 16.2 | 91.9 |
| EL-A029711 | | Cerc - from broad mix (EL) | 3.0 | 5078.4 | 220.0 | 22.9 | 15.9 | 92.3 |
| EL-A027140 | | CN927-202 x 08-5E | 4.0 | 5407.0 | 219.8 | 24.6 | 16.0 | 91.9 |
| EL-A024966 | | SR w/ salt (elites & low water) | 4.3 | 6330.8 | 219.7 | 28.8 | 16.1 | 91.9 |
| EL-A024957 | | Rhizoc, rz, Trad EL, Cerc sln | 3.0 | 5537.4 | 219.1 | 25.2 | 16.1 | 91.7 |
| EL-A029686 | | SF mix: 2011 group A | 2.7 | 3855.3 | 218.8 | 17.7 | 15.9 | 92.2 |
| EL-A027018 | | [EL55 x 08-5E (nematode)] x 2010 5A : Nema Yld | 3.7 | 5611.5 | 218.8 | 25.5 | 15.8 | 92.4 |
| EL-A029687 | self fertile "B" cross | SF mix: "B" (group B) | 3.0 | 5090.1 | 216.0 | 23.6 | 15.9 | 91.6 |
| EL-A029709 | | Saunders and Storage mix | 3.0 | 4701.1 | 215.7 | 21.9 | 15.7 | 92.2 |
| EL-A027149 | Group5 - SR98 | Rhizoc - SR98 | 3.0 | 4302.2 | 214.8 | 19.9 | 15.8 | 91.8 |
| EL-A024961 | | Rhizoc / salt tol group | 3.3 | 5368.8 | 213.7 | 25.1 | 15.6 | 92.1 |
| EL-A027136 | | PI 518160 germ test seln | 3.7 | 4872.9 | 212.6 | 23.0 | 15.8 | 91.3 |
| EL-A027158 | Group2 - SR rhizoc | Rhizoc - SR | 3.0 | 3563.3 | 203.8 | 17.1 | 15.3 | 91.0 |
| EL-A027156 | Group1 - Cerc SR | Broad SR stream - Cerc sln | 3.7 | 2699.6 | 203.5 | 13.0 | 15.4 | 90.4 |
| EL-A027154 | | Rhizoc / rhizopus selection | 3.3 | 4194.3 | 201.1 | 20.9 | 15.1 | 90.9 |
| EL-A027145 | | PI 266100 germ test seln | 4.3 | 4923.6 | 194.1 | 25.1 | 14.5 | 91.5 |
| EL-A024965 | | Germ test selns (salt w/ SR) | 4.0 | 4449.7 | 183.8 | 23.8 | 14.2 | 90.1 |
| EL-A027138 | | PI 232889 germ test seln | 3.3 | 4185.8 | 176.5 | 23.5 | 13.8 | 89.8 |
| EL-A027151 | Group7 - Salt | Salt tolerant selections group | 4.0 | 3233.6 | 172.1 | 18.9 | 13.9 | 88.6 |
| EL-A027155 | Group3 - RngA Aph | RngA - Aph + Rhizoc | 3.0 | 1941.0 | 160.3 | 12.0 | 13.1 | 88.4 |
| Grand Mean | | | 3.4 | 4717.2 | 219.7 | 21.4 | 16.0 | 92.0 |
| CV | | | 20.4 | 19.6 | 6.7 | 16.7 | 4.7 | 1.0 |
| LSD (P=.05) | | | 0.8 | 1292.8 | 20.7 | 5.0 | 1.1 | 1.2 |

Thirty Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) *Beta* Collection [garden beet, sugar beet, leaf beet, fodder beet (*Beta vulgaris* L), and wild beet (*Beta* spp.)] were evaluated for resistance to *Cercospora beticola*. Internal controls included a moderately susceptible check, C869, and a resistant check, EL50/2 (PI 664912). One entry, PI 663876, was not included in analysis as only one plot was available for rating. At the 12 Sep rating, means of the resistant and susceptible internal controls for the entire nursery were 3.1 and 5.0, respectively. At the peak of the epiphytotic in 2011 (24 Aug), these means were 3.5 and 5.9 for resistant and susceptible, respectively. An analysis of variance (PROC GLM - SAS) on the disease indices (visual evaluation scores) determined that there were significant differences among entries ($P \leq 0.05$) on all dates of evaluation. One accession, PI 504285, was not significantly different from the resistant control at all four ratings. Another accession, PI 504186, was not significantly different from the resistant control at the final two rating dates. In contrast, two accessions, W6 17103 and PI 578086 had average ratings that were significantly higher than the susceptible control at all but the first rating date, and another accession, PI 590582 was significantly higher at the final two rating dates. Twelve accessions (Ames 4219, PI 504186, PI 504285, PI 518307, PI 518339, PI 518360, PI 518365, PI 518367, PI 518411, PI 546523, PI 599352, and PI 590811) required removal of seed stalks from at least one replicate during the season. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at http://www.ars-grin.gov/npgs.

**Table 2:** Cercospora leaf spot reaction of 30 Plant Introductions.

| | Identification | | | Disease Index[z] | | | |
|---|---|---|---|---|---|---|---|
| Entry | Donor's ID | subsp. | Origin | Aug 22 | Aug 29 | Sep 5 | Sep 12 |
| Ames 4219 | IDBBNR 5606 | *maritima* | United Kingdom | 3.3 | 3.7 | 3.7 | 4.7 |
| PI 504186 | wild beet | *maritima* | Italy | 2.3 | 3.3 | 3.3 | 3.3 |
| PI 504285 | wild beet | *maritima* | France | 1.3 | 1.7 | 2.7 | 3.0 |
| PI 518307 | IDBBNR 5801 | *maritima* | United Kingdom | 3.7 | 4.3 | 4.3 | 5.0 |
| PI 518339 | IDBBNR 5833 | *maritima* | United Kingdom | 3.3 | 4.3 | 4.3 | 5.0 |
| PI 518345 | IDBBNR 5839 | *maritima* | United Kingdom | 3.3 | 3.7 | 4.0 | 4.7 |
| PI 518347 | IDBBNR 5841 | *maritima* | United Kingdom | 2.7 | 3.7 | 4.0 | 4.3 |
| PI 518353 | IDBBNR 5847 | *maritima* | United Kingdom | 2.7 | 3.7 | 4.0 | 4.7 |
| PI 518360 | IDBBNR 5854 | *maritima* | United Kingdom | 2.7 | 3.3 | 4.3 | 4.7 |
| PI 518365 | IDBBNR 5859 | *maritima* | United Kingdom | 3.0 | 3.7 | 4.0 | 4.3 |
| PI 518367 | IDBBNR 5861 | *maritima* | United Kingdom | 3.0 | 3.7 | 4.0 | 4.7 |
| PI 518411 | IDBBNR 5908 | *maritima* | Ireland | 3.3 | 4.0 | 4.3 | 5.0 |
| PI 546523 | IDBBNR 9690 | *maritima* | Greece | 2.0[w] | 3.0[w] | 3.5[w] | 4.0[w] |
| PI 599352 | R 720 | *maritima* | United States | 2.7 | 3.3 | 4.0 | 4.3 |
| PI 663876 | C23BM | *maritima* | United States | nd | nd | nd | nd |
| PI 578086 | C76-43 | *vulgaris* | United States | 4.0 | 5.3 | 5.7 | 6.7 |
| PI 590580 | US 033 | *vulgaris* | United States | 3.7 | 4.7 | 5.0 | 6.3 |
| PI 590581 | US 015 | *vulgaris* | United States | 3.0 | 3.7 | 4.3 | 5.3 |
| PI 590582 | US 056/2 | *vulgaris* | United States | 4.0 | 5.0 | 6.0 | 7.0[2] |
| PI 590583 | US 035 | *vulgaris* | United States | 3.0[w] | 4.0[w] | 5.0[w] | 6.0[w] |
| PI 590675 | C 32 | *vulgaris* | United States | 3.3 | 4.7 | 5.0 | 6.3 |
| PI 590725 | L 34 | *vulgaris* | United States | 3.0 | 4.3 | 5.3 | 6.3 |
| PI 590743 | SLC 19 | *vulgaris* | United States | 4.0 | 5.3 | 5.3 | 6.3 |
| PI 590747 | SLC 23 | *vulgaris* | United States | 3.3 | 4.7 | 5.0 | 6.3 |
| PI 590748 | SLC 35 | *vulgaris* | United States | 2.7 | 4.0 | 4.0 | 5.0 |
| PI 590811 | SLC 003 | *vulgaris* | United States | 3.0[w] | 4.0[w] | 4.0[w] | 4.0[w] |
| PI 590835 | C 789 | *vulgaris* | United States | 2.3 | 3.3 | 4.0 | 5.3 |
| PI 590851 | C 779 | *vulgaris* | United States | 1.7 | 3.0 | 3.7 | 4.0 |
| PI 610268 | SLC 101 | *vulgaris* | United States | 1.5[w] | 2.5[w] | 3.5[w] | 3.5[w] |
| W6 17103 | US 41 | *vulgaris* | United States | 4.0 | 5.3 | 6.0 | 7.3 |
| Leaf Spot Susceptible Check [y] | C869…USA | | | 3.0 | 4.0 | 4.3 | 5.3 |
| Leaf Spot Resistant Check [x] | (EL50/2)…USA | | | 1.0 | 1.3 | 2.7 | 3.0 |
| | | | $LSD_{0.05}$ | 1.42 | 1.39 | 1.21 | 1.53 |
| Trial Mean | | | | 2.9 | 3.9 | 4.3 | 5.1 |

[z] Disease Index is based on a scale where 0=healthy to 10=all leaves dead.
[y] The Leafspot Susceptible Check is C869 (Lewellen, R.T. 2004. Crop Sci. 44:357)
[x] The Leafspot Resistant Check is EL50/2 (PI 664912).
[w] Numbers based on average from two plots as the third plot had no plants
nd = not done as insufficient replicates were available at the rating dates.

A series of other trials were done to advance breeding and genetic materials. The population 'CRB5', F5 materials derived from the cross between C869 (Cercospora susceptible) and EL50 (resistant), was planted in the section of the nursery that was inoculated with *Cercospora*. Each entry was a single 1-row plot, and 621 CRB5 entries were evaluated, of which 588 (95%) emerged and were scored for disease (and subsequently harvested for a further generation of selfing). Stands were generally thin (mean = 12.9 plants /plot; standard deviation = 9.52; range = 0 to 55). Cercospora ratings were done on August 22, September 5, and September 19. The same scoring system as above was used, and the range of values observed in the CRB5 materials was between 2.0 and 6.0, however relatively few entries were at either extreme (Figure 1, obtained using JMP v10 software), which is consistent with previous generation results. Inheritance of *Cercospora* resistance is complex. This population was also segregating for a novel curled petiole phenotype

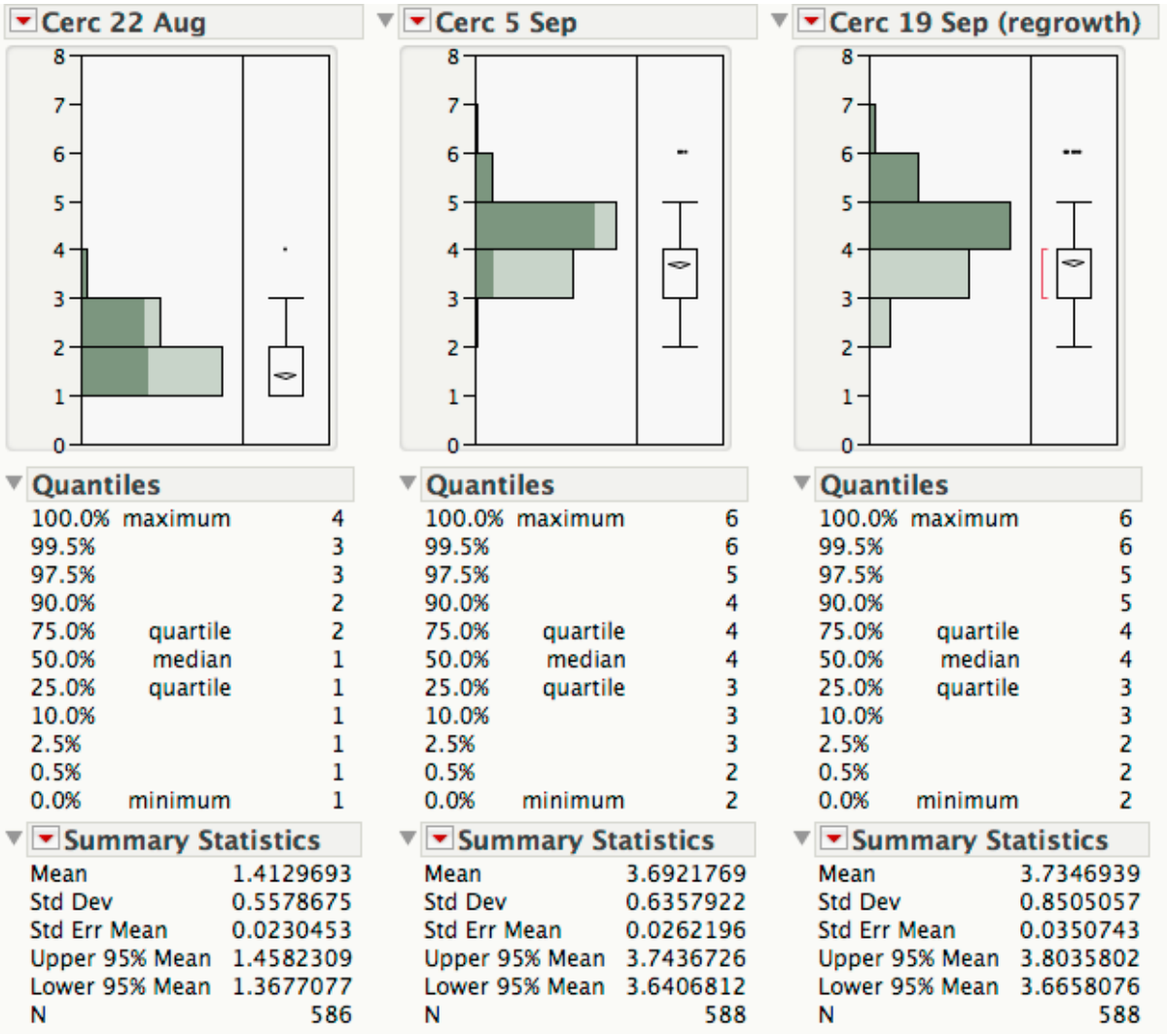


**Figure 1:** Distribution of Cercospora leaf spot ratings for the CRB5 recombinant inbred population. Darker bars are entries with higher susceptibility on the final rating date.

Other recombinant inbred populations were advanced, including 115 HSB4 (cross between C869 and L19 for analyses of the genetics of high sugar content), 79 RTA5 (cross between C869 and EL51 for genetic analyses of Rhizoctonia resistance), and 141 C869 x WB879 advanced generation materials that appear to be segregating for presence /absence of the enlarged root phenotype characteristic of beet root crop types. A series of 193 early generation self-fertile materials was also evaluated for emergence and general performance, of which 25 were selected for further breeding. Finally, 281 MSR6 recombinant inbred lines (C869 x table beet) were evaluated for root and sugar yield. Sugar data is still being evaluated, and root weight data is summarized in Figure 2. This population is being used to examine genetics of sucrose yield.

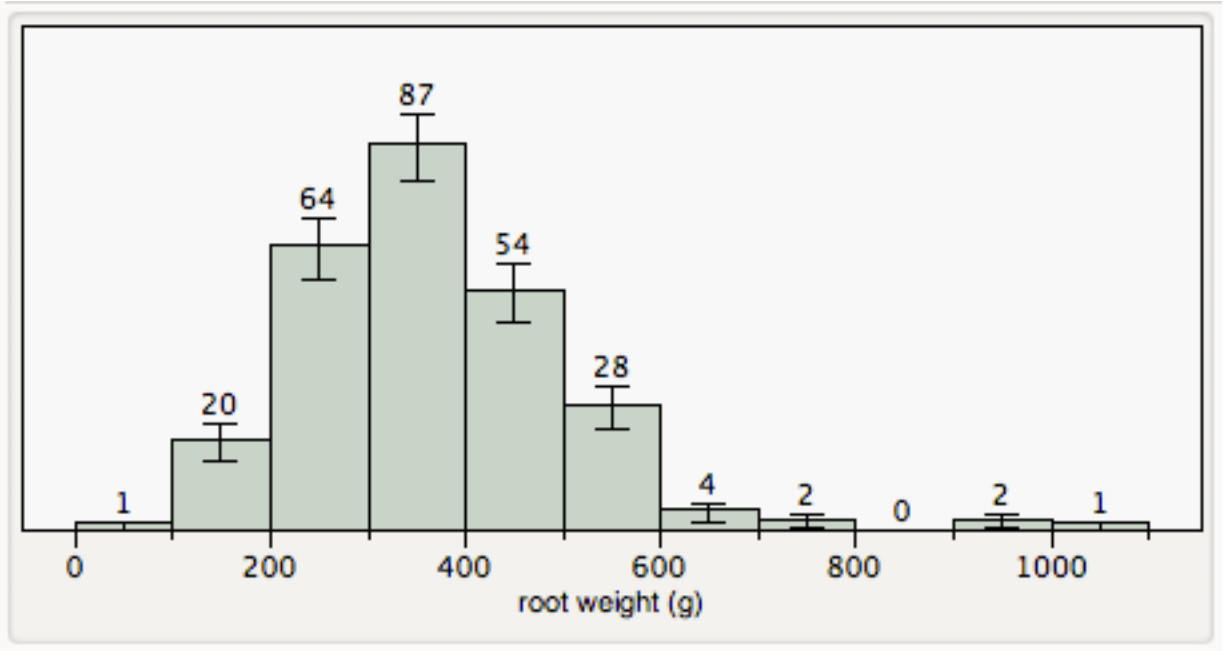


**Figure 2:** Distribution of average weight of 5 largest beets from each of 281 MSR6 entries.

We extend our gratitude to Paul Horny and Dennis Fleischmann for their essential help with nursery and farm operations, to Michigan Sugar for help with thinning and agronomic evaluations, and to MSU undergrads Chris Farver, Nick Boerman, Bridgett Bli and Jacob Stiefel for their help throughout the field season.

**Efficacy of application of foliar fungicides for control of Cercospora leaf spot in sugar beet.**
W. W. Kirk, R. L Schafer, N. Rosenzweig. Dept. Plant, Soil and Microbial Science, MSU

Sugar beet cv. ACH RR-824 was PAT-treated and planted at the Michigan State University Bean and Beet Farm, Richville, MI on 4 Apr. Seed was planted at 1" depth into four-row by 50-ft plots (ca. 4.375 in. between plants to give a target population of 275 plants/100ft. row) with 30" between rows replicated four times in a randomized complete block design. Fertilizer was drilled into plots immediately before planting, formulated according to results of soil tests (125 lb 46-0-0/A). No additional nitrogen was applied to the growing crop. Plots were inoculated by spraying a conidial suspension of C. beticola collected from infected sugarbeet foliar residue from the previous season on 16 Jun across all plots. Fungicides were applied starting after the 45 Beetcast disease severity values were recorded in the area on 1 Jul (Ontario Weather Network, Ridgetown, ON, Canada), applications were initiated on 4 Jul and three to five applications were made. Fungicides were applied with a hand-held R&D spray boom delivering 25 gal/A (80 p.s.i.) and using three XR11003VS nozzles per row. Induce 480XL 0.25 % v/v was applied where indicated as "Induce" on the results table unless a different rate was indicated. Weeds were controlled by cultivation and with Roundup Original Max 2.0 pt/A applied at GS2-4 and GS 6-8. Insects were controlled as necessary. Foliar leaf spot severity (%) was measured on 24 Aug and 5 Sep using a 0 – 10 scale. Foliar leaf spot severity was measured using a 0 - 10 scale; 0= 0%; 1= 1 - 5, 0.1%; 2= 6 -12, 0.35%; 3= 13 - 25, 0.75%; 4= 26 - 50, 1.5%; 5= 51 - 75, 2.5%; spots/leaf or severity %; respectively; 6= 3% (proven economic damage); 7= 6%; 8= 12%; 9= 25%; and 10$\underline{>}$ 50% severity. The relative area under the late blight disease progress curve was calculated for each treatment using percentage leaf spot severity from the date of appearance of leaf spot to 29 Aug, a period of 21 days. Beetroots were machine-harvested on 19 Sep and individual treatments were weighed. Sugar content was measured at the Michigan Sugar Company analytical service laboratory. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Average daily air temperature ($^{o}$F) from 1 Apr was 45.3, 61.5, 67.8, 74.9, 68.2 and 64.5 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively) and the number of days with maximum temperature >90$^{o}$F was 0, 0, 5, 12, 1 and 0 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively). Average daily relative humidity (%) over the same period was 57.3, 61.0, 58.9, 63.1, 67.5 and 65.6 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively). Precipitation was 1.19, 3.92, 1.1, 3.62, 4.03 and 1.32 in (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively). There were 169 Beetcast DSV values accumulated in the Saginaw area from 1 May to 17 Sep at Richville, MI.

Weather conditions during the growing season were very conducive for the development of Cercospora leaf spot (CLS) and of note were the hot and humid conditions during Jul and Aug. CLS reached an index of about 8.0 8.3, 9.3 and 9.5 in the untreated control by 8, 17, 22 and 29 Aug, respectively. Treatments with CLS indices less than 5.5, 6.0, 7.5 and 8.0 had significantly less Cercospora leaf spot than the untreated control by 8, 17, 22 and 29 Aug, respectively. Several treatments had substantial disease development [CLS indices >6 (proven economic impact)] by 8 Aug and many more by the end of the evaluation period. The RAUDPC in the untreated control reached 33.8 by 29 Aug and all treatments had significantly lower RAUDPC values in comparison to the untreated control. Treatments with yield greater than 24.2 t/A had significantly greater yield per acre than the untreated control (21.0 t/A). Treatments with recoverable white sucrose per acre greater than 5786 lb/A had significantly greater yield per acre than the untreated control (4761 lb/A). No phytotoxicity was observed from any treatments.

**Table 1**. Control of Cercospora leaf spot with fungicides.

| Treatment and rate/A | Cercospora leaf spot[a] (0-10 scale) | | | | RAUDPC[b] (0-100) 29 Aug | Yield (t/A) | RWSA[c] (lb) |
|---|---|---|---|---|---|---|---|
| Vertisan 1.67EC 10 fl oz (A-D[d])…….. | 4.5cd[e] | 7.5abc | 8.3a-d | 8.5a-d | 15.7de | 25.7h-k | 6136d-i |
| Vertisan 1.67EC 10 fl oz + Induce[f] (A-D) | 7.0abc | 8.3a | 8.8ab | 9.0ab | 26.1bc | 23.6kl | 5223ij |
| Vertisan 1.67EC 16 fl oz + Headline 2.09SC 9.2 fl oz (A-D)……..... | 7.5ab | 8.0ab | 8.3a-d | 8.8abc | 20.2cd | 25.6h-k | 6081e-i |
| Proline 480SC 5 fl oz (A-D)…….…… | 0.0e | 4.0f-k | 5.5f-k | 6.8e-i | 3.5g-i | 31.0ab | 7481a-c |
| Headline 2.09SC 12 fl oz (A-D)…….....… | 4.5cd | 7.3a-d | 7.8a-e | 8.5a-d | 16.1de | 25.1ijk | 5746hij |
| Vertisan 1.67EC 16 fl oz (A-D)…… | 8.0a | 8.3a | 8.5abc | 9.0ab | 27.4b | 25.2ijk | 5572h-j |
| Vertisan 1.67EC 24 fl oz (A-D)…… | 6.5abc | 8.0ab | 8.3a-d | 9.0ab | 20.5cd | 24.2kl | 5375ij |
| Kocide 3000 46.1WG 2 lb (A-D)……. | 6.0abc | 8.0ab | 8.0a-d | 9.0ab | 19.1d | 23.8kl | 5361ij |
| Vertisan 1.67EC 16 fl oz + Kocide 3000 46.1WG 2 lb (A-D)…….… | 5.5abc | 8.0ab | 8.3a-d | 8.8abc | 18.4d | 26.0g-k | 5907ghi |
| Vertisan 1.67EC 16 fl oz + Manzate 75WG 2 lb (A-D)……..…….. | 4.5cd | 7.0a-e | 7.5a-f | 8.0a-e | 11.4ef | 26.2f-k | 6007f-i |
| Inspire 2.08EC 7 fl oz + Kocide 3000 46.1WG 2 lb (A); Super Tin 4L 8 fl oz + Kocide 3000 46.1WG 2 lb (B); Proline 480SC 5 fl oz + Induce + Kocide 3000 46.1WG 2 lb (C)……..…. | 1.0e | 4.8e-i | 5.8e-j | 7.0d-h | 5.0g-i | 28.1b-j | 6868b-g |
| Inspire 2.08EC 7 fl oz + Manzate 75WG 2 lb (A); Super Tin 4L 8 fl oz + Manzate 75WG 2 lb (B); Proline 480SC 5 fl oz + Induce + Manzate 75WG 2 lb (C)…… | 2.0de | 5.3c-g | 6.5c-i | 7.0d-h | 6.5f-i | 26.8d-k | 6823b-g |
| Vertisan 1.67EC 16 fl oz + Manzate 75WG 2 lb (A); Super Tin 4L 8 fl oz + Manzate 75WG 2 lb (B); Proline 480SC 5 fl oz + Induce + Manzate 75WG 2 lb (C)…… | 0.0e | 4.0f-k | 6.8b-h | 6.8e-i | 5.1g-i | 29.9a-d | 7012b-f |
| Vertisan 1.67EC 16 fl oz + Kocide 3000 46.1WG 2 lb (A); Super Tin 4L 8 fl oz + Kocide 3000 46.1WG 2 lb (B); Proline 480SC 5 fl oz + Induce + Kocide 3000 46.1WG 2 lb (C)……..…. | 0.0e | 5.0d-h | 6.3d-i | 7.0d-h | 5.6f-i | 29.3b-g | 6855b-g |
| Topguard 1.04SC 14 fl oz + Koverall 75DF 1.5 lb + Induce (A-D)…….…. | 1.0e | 1.5lm | 2.8mn | 4.5l | 1.9hi | 31.0ab | 7776ab |
| Topguard 1.04SC 14 fl oz + Super Tin 4L 8 fl oz (A-D)……...…. | 0.0e | 1.8klm | 3.8j-n | 5.5h-l | 2.0hi | 26.1g-k | 6866b-g |
| Topguard 1.04SC 14 fl oz + Koverall 75DF 1.5 lb + Induce (A,B); Headline 2.09SC 9.2 fl oz + Super Tin 4L 8 fl oz (C,D)…… | 0.0e | 1.8klm | 2.8mn | 4.5l | 1.1i | 33.1a | 8492a |
| Eminent 125SL 13 fl oz + Topsin 4.5F 7.6 fl oz (A); Super Tin 4L 8 fl oz (B); Headline 2.09SC 9 fl oz (C); Eminent 125SL 13 fl oz (E)……..….. | 1.5e | 7.0a-e | 8.0a-d | 8.0a-e | 9.0fg | 29.7b-e | 7593ab |
| Eminent 125SL 13 fl oz + Super Tin 4L 8 fl oz (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Headline 2.09SC 9 fl oz (C); Eminent 125SL 13 fl oz (E)……..….. | 1.0e | 4.5f-j | 6.3d-i | 6.5e-j | 4.3g-i | 28.9b-h | 7091b-e |

| Treatment and rate/A | Cercospora leaf spot[a] (0-10 scale) | | | | RAUDPC[b] (0-100) 29 Aug | Yield (t/A) | RWSA[c] (lb) |
|---|---|---|---|---|---|---|---|
| Eminent 125SL 13 fl oz + Super Tin 4L 8 fl oz (A); Super Tin 4L 8 fl oz (B); Headline 2.09SC 9 fl oz (C); Eminent 125SL 13 fl oz (E)…….. | 0.0e | 2.5i-l | 5.0g-l | 5.8g-l | 2.0hi | 29.6b-e | 7543ab |
| Eminent 125SL 13 fl oz + Topsin 4.5F 7.6 fl oz (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Headline 2.09SC 9 fl oz (C); Eminent 125SL 13 fl oz (E)……..……. | 0.0e | 6.0a-f | 8.0a-d | 8.0a-e | 6.8f-i | 30.9a-c | 7723ab |
| Eminent 125SL 13 fl oz + Topsin 4.5F 7.6 fl oz (A); Headline 2.09SC 9 fl oz (B); Super Tin 4L 8 fl oz (C); Eminent 125SL 13 fl oz (E)……..……. | 0.0e | 2.5i-l | 4.8h-m | 6.0f-l | 2.1hi | 28.9b-h | 7179bc |
| Eminent 125SL 13 fl oz + Super Tin 4L 8 fl oz (A); Headline 2.09SC 9 fl oz (B); Super Tin 4L 8 fl oz (C); Eminent 125SL 13 fl oz (E)……..……. | 0.0e | 0.0m | 2.3n | 4.8kl | 0.7i | 27.7c-j | 7270bc |
| Eminent 125SL 13 fl oz + Super Tin 4L 8 fl oz (A); Headline 2.09SC 9 fl oz (B); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (C); Eminent 125SL 13 fl oz (E)…….. | 0.0e | 1.8klm | 2.3n | 5.5h-l | 1.5Hi | 25.0jk | 6492c-h |
| Eminent 125SL 13 fl oz + Echo 720SC 16 fl oz (A); Echo 720SC 16 fl oz (B); Headline 2.09SC 9 fl oz (C); Echo 720SC 16 fl oz (E)……..…….. | 0.0e | 4.0f-k | 5.5f-k | 7.0d-h | 3.8g-i | 28.5b-h | 7088b-e |
| Eminent 125SL 13 fl oz + Echo 720SC 16 fl oz (A); Echo 720SC 16 fl oz (B); Headline 2.09SC 9 fl oz (C); Echo 720SC 24 fl oz (E)..... | 1.0e | 3.8f-l | 5.5f-k | 6.3f-k | 2.9Hi | 31.0ab | 7847ab |
| Eminent 125SL 13 fl oz + Echo 720SC 16 fl oz (A); Echo 720SC 16 fl oz + Topsin 4.5F 7.6 fl oz (B); Headline 2.09SC 9 fl oz (C); Echo 720SC 16 fl oz (E)……... | 0.0e | 4.0f-k | 5.8e-j | 7.0d-h | 3.2g-i | 29.5b-f | 7334bc |
| SA-0040301 SL 14 fl oz (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Super Tin 4L 8 fl oz (C); SA-0040301 SL 14 fl oz (E)…… | 5.0bc | 7.5abc | 8.0a-d | 8.5a-d | 16.3de | 26.4e-k | 5734hij |
| SA-0040301 SL 17 fl oz (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Super Tin 4L 8 fl oz (C); SA-0040301 SL 17 fl oz (E)…… | 5.5abc | 8.0ab | 8.5abc | 9.0ab | 20.9cd | 29.5b-f | 6820b-g |

| Treatment and rate/A | Cercospora leaf spot[a] (0-10 scale) | | | | RAUDPC[b] (0-100) 29 Aug | Yield (t/A) | RWSA[c] (lb) |
|---|---|---|---|---|---|---|---|
| Eminent 125SL 13 fl oz + Manzate Prostick 75DF 2 lb (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Inspire XT 2.08SC 7 fl oz + Manzate Prostick 75DF 2 lb (C); Cuprofix Ultra 71.1DF + Manzate Prostick 75DF 2 lb (D); Proline 480SC 5 fl oz + Manzate Prostick 75DF 2 lb (E)…….... | 0.0e | 2.8h-l | 4.5i-m | 5.0jkl | 1.8hi | 28.4b-i | 7388bc |
| Eminent 125SL 13 fl oz + Manzate Prostick 75DF 2 lb (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Headline 2.09SC 9 fl oz + Manzate Prostick 75DF 2 lb (C); Cuprofix Ultra 71.1DF + Manzate Prostick 75DF 2 lb (D); Proline 480SC 5 fl oz + Manzate Prostick 75DF 2 lb (E)…….... | 0.0e | 2.3j-m | 3.5k-n | 5.8g-l | 1.7hi | 28.0b-j | 7327bc |
| Eminent 125SL 13 fl oz + Manzate Prostick 75DF 2 lb (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Proline 480SC 5 fl oz + Manzate Prostick 75DF 2 lb (C); Cuprofix Ultra 71.1DF + Manzate Prostick 75DF 2 lb (D); Inspire XT 2.08SC 7 fl oz + Manzate Prostick 75DF 2 lb (E)…….... | 0.0e | 4.3f-j | 6.3d-i | 7.3c-g | 3.9g-i | 27.6c-j | 7149b-d |
| Proline 480SC 5 fl oz (A); Super Tin 4L 8 fl oz + Topsin 4.5F 7.6 fl oz (B); Topguard 1.04SC 14 fl oz + Manzate Prostick 75DF 2 lb (C); Cuprofix Ultra 71.1DF + Super Tin 4L 8 fl oz (D); Inspire XT 2.08SC 7 fl oz + Eminent 125SL 13 fl oz (E)…….. | 1.5e | 5.8b-f | 7.0b-g | 7.3c-g | 6.1f-i | 28.9b-h | 7787ab |
| Bravo WS 6SC 16 fl oz (A-E)…….. | 1.5e | 5.3c-g | 7.0b-g | 7.0d-h | 7.3f-h | 29.1b-g | 6889b-g |
| SA-0040501 SL 22 fl oz (A,E); Super Tin 4L 8 fl oz (B); Headline 2.09SC 9 fl oz (C)…….. | 1.0e | 5.5c-f | 7.5a-f | 7.5b-f | 6.1f-i | 29.3b-g | 7633ab |
| Untreated Check…… | 8.0a | 8.3a | 9.3a | 9.5a | 33.8a | 21.0i | 4761j |

[a] Foliar leaf spot severity; 0 - 10 scale; 0= 0%; 1 = 1 - 5, 0.1%; 2 = 6 -12, 0.35%; 3 = 13 - 25, 0.75%; 4 = 26 - 50, 1.5%; 5 = 51 - 75, 2.5%; spots/leaf or severity %; respectively; 6 = 3% (proven economic damage); 7 = 6%; 8 = 12%; 9 = 25%; and 10 ≥ 50% severity

[b] RAUDPC = The relative area under the late blight disease progress curve calculated for each treatment from the date of the first evaluation to 29 Aug, a period of 21 days (Max = 100)

[c] RWSA = Recoverable White Sucrose per Acre (Ton/A* Recoverable White Sucrose per Ton of sugarbeet)

[d] Application dates: A= 4 Jul; B= 18 Jul; C= 31 Jul; D= 9 Aug; E= 23 Aug

[e] Means followed by same letter are not significantly different at P = 0.05 (Fishers LSD)

[f] Induce applied at 0.25% v/v

**Control of Rhizoctonia crown and root rot with fungicides, 2012.**

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Sugar beet cv. ACH RR-824 was PAT-treated and planted at the Michigan State University Bean and Beet Farm, Richville, MI on 4 Apr. Seed was planted at 1" depth into four-row by 50-ft plots (ca. 4.375 in. between plants to give a target population of 275 plants/100ft. row) with 30" between rows replicated four times in a randomized complete block design. Fertilizer was drilled into plots immediately before planting, formulated according to results of soil tests (125 lb 46-0-0/A). No additional nitrogen was applied. All fungicides were applied with a hand held R&D spray boom delivering 10 gal/A (50 p.s.i.) and using one XR8003 nozzle per row in a 6" band at planting or at GS 4-6. Applications were made at planting (A); and banded applications on 10 May at GS 4-6 (B), respectively. Cercospora leaf spot was controlled with an application of Eminent 125SL (13 fl oz) on 13 Jul and Inspire 2.08EC 7 fl oz + Kocide 3000 46.1WG 2 lb on 5 Aug. Weeds were controlled by cultivation and with Roundup Original Max 2.0 pt/A applied at GS2-4 and GS 6-8. Insects were controlled as necessary. Plant stand was rated 13, 21 and 37 days after planting (DAP) and relative rate of emergence was calculated as the Relative Area Under the Emergence Progress Curve [RAUEPC from 0 – 37 DAP, maximum value = 100]. Plots were inoculated on 4 may [30 days after planting (DAP)] by spreading *R. solani* Anastemoses Group 2.2 (IIIB) infested millet across all plants in each plot. Incidence of infected plants was evaluated on 84 and 158 DAP. Samples of 50 beets per plot were harvested 154 DAP (10 ft from start of each plot from two center rows) and assessed for crown and root rot (*R. solani*) incidence (%) and severity. Severity of crown and root rot was measured as an index calculated by counting the number of roots (n = 20) falling in class 0 = 0%; 1 = 1 - 5%; 2 = 6 -10%; 3 = 11 – 15%; 4 =15 - 25%; 5 = 25 – 50%; 6 = 50 – 100% surface area of root affected by lesions; and 7 = dead and/or extensively decayed root. The number in each class is multiplied by the class number and summed. The sum is multiplied by a constant to express as a percentage. Increasing index values indicated the degree of severity. The number of beets falling into classes 0 – 3 was summed and a percentage calculated as marketable beets. The trial was not harvested due to the high incidence and severity of crown and root rot. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Meteorological variables were measured with a Campbell weather station located at the farm, latitude 43.3995 and longitude -83.6980 deg. Average daily air temperature ($^{o}$F) from 1 Apr was 45.3, 61.5, 67.8, 74.9, 68.2 and 64.5 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively) and the number of days with maximum temperature >90$^{o}$F was 0, 0, 5, 12, 1 and 0 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively). Average daily relative humidity (%) over the same period was 57.3, 61.0, 58.9, 63.1, 67.5 and 65.6 (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively). Precipitation was 1.19, 3.92, 1.1, 3.62, 4.03 and 1.32 in (Apr, May, Jun, Jul, Aug, to 17 Sep, respectively).

Treatments with final plant stand greater than 71.3% were significantly different from the non-inoculated untreated check (56.1%) in terms of plant stand. No treatments were significantly different from either check in terms of RAUEPC. Soil temperature and moisture conditions enhanced development of crown and root rot throughout the season. The initial evaluation of crown and root indicated that no treatments were significantly different from the inoculated untreated check (6.0%). The evaluation of crown and root at harvest indicated that all treatments were significantly different from the inoculated untreated check (25.2%). All treatments had a lower severity index of crown and root rot on the beetroots and were significantly different to the untreated control (79.5). There was background crown and root to in the trial and although at low levels in the non-inoculated check treatments with less than 38.0 severity index of crown and root rot on the beetroots were not significantly different from the

non-inoculated check (22.5). In terms of marketable beetroots, treatments with a percentage of marketable greater than 62.5% were significantly different to the inoculated untreated control (44.5%). Treatments with less than 79.5% marketable beetroots were significantly different from the not inoculated check (93.5% marketable) and the next best group were between 72.5 to 88.5% marketable. No phytotoxicity was observed from any treatments.

**Table 1.** Efficacy of fungicides against Rhizoctonia crown and root rot.

| Treatment and rate/1000 ft. row | Plant stand[a] 37 DAP[b] (%) | | RAUEPC[c] 0 – 37 DAP | | Crown and root rot Incidence 84 DAP (%) | | Incidence 154 DAP (%) | | Severity[d] 154 DAP (%) | | Marketable beets (%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vertisan 1.67EC 0.4 fl oz (A[e])….. | 67.4 | abc[f] | 22.3 | a | 6.3 | a-g | 31.0 | c-g | 10.4 | c-h | 80.5 | a-e |
| Vertisan 1.67EC 0.8 fl oz (A)……. | 72.6 | a | 21.5 | a | 8.8 | ab | 35.0 | b-g | 11.7 | b-h | 72.0 | c-f |
| Vertisan 1.67EC 1.2 fl oz (A)……. | 56.6 | abc | 18.5 | a | 5.3 | a-g | 39.5 | b-f | 10.3 | c-h | 72.5 | c-f |
| Vertisan 1.67EC 0.4 fl oz (B)…….. | | | | | 2.5 | fg | 29.0 | c-g | 10.1 | c-h | 81.5 | a-e |
| Vertisan 1.67EC 0.8 fl oz (B)……. | | | | | 7.5 | a-e | 28.5 | d-g | 8.9 | e-h | 86.0 | abc |
| Vertisan 1.67EC 1.2 fl oz (B)……. | | | | | 8.0 | a-d | 35.5 | b-g | 12.5 | b-g | 74.5 | b-f |
| Vertisan 1.67EC 0.8 fl oz (A); Vertisan 1.67EC 0.8 fl oz (B)…….. | 57.7 | abc | 18.6 | a | 2.0 | fg | 42.5 | bcd | 17.8 | b | 67.5 | ef |
| Quadris 2.08FL 0.6 fl oz (A)…….. | 64.9 | abc | 21.1 | a | 3.5 | c-g | 34.5 | b-g | 12.6 | b-g | 77.5 | b-e |
| Quadris 2.08FL 0.6 fl oz (B)…….. | | | | | 1.8 | g | 22.5 | g | 6.4 | gh | 88.0 | ab |
| Moncut 70DF 0.24 oz (A)……... | 58.9 | abc | 17.5 | a | 2.3 | fg | 38.0 | b-g | 16.3 | bc | 75.0 | b-f |
| Moncut 70DF 0.37 oz (A)……... | 58.2 | abc | 18.5 | a | 3.8 | c-g | 38.0 | b-g | 11.1 | b-h | 77.5 | b-e |
| Moncut 70DF 0.74 oz (A)……... | 69.1 | ab | 22.6 | a | 9.3 | a | 28.5 | d-g | 10.6 | c-h | 81.0 | a-e |
| Moncut 70DF 0.48 oz (B)……... | | | | | 3.3 | d-g | 26.5 | d-g | 8.1 | gh | 88.0 | ab |
| Moncut 70DF 0.74 oz (B)……... | | | | | 3.3 | d-g | 49.5 | b | 15.7 | b-e | 62.5 | f |
| Moncut 70DF 0.24 oz (A); Moncut 70DF 0.48 oz (B)……... | 50.7 | bc | 18.6 | a | 2.8 | efg | 29.0 | c-g | 7.9 | gh | 88.5 | ab |
| Priaxor 4.17SC 0.34 fl oz (A)……. | 54.6 | abc | 19.4 | a | 6.5 | a-g | 28.0 | d-g | 8.8 | fgh | 83.0 | a-d |
| Priaxor 4.17SC 0.46 fl oz (A)……. | 48.6 | c | 17.7 | a | 2.8 | efg | 25.0 | efg | 9.4 | d-h | 79.5 | a-e |
| Priaxor 4.17SC 0.34 fl oz (B)…….. | | | | | 5.0 | a-g | 37.5 | b-g | 15.0 | b-f | 74.5 | b-f |
| Priaxor 4.17SC 0.46 fl oz (B)…….. | | | | | 5.0 | a-g | 31.5 | c-g | 9.2 | d-h | 77.5 | b-e |
| Priaxor 4.17SC 0.46 fl oz (A,B)….. | 63.6 | abc | 20.6 | a | 4.0 | b-g | 45.0 | bc | 16.6 | bc | 62.5 | f |
| ActinoGrow 0.0371WP 0.34 oz (A) ActinoGrow 0.0371WP 0.46 oz (B) | 71.3 | ab | 23.8 | a | 4.3 | b-g | 36.0 | b-g | 12.4 | b-h | 76.0 | b-f |
| Topsin-M 70WP 1.84 oz (B)…….. | | | | | 9.3 | a | 41.0 | b-e | 15.9 | bcd | 70.5 | def |
| Serenade Soil 1.34SC 2.9 fl oz (A). | 62.0 | abc | 21.2 | a | 6.8 | a-f | 24.0 | fg | 8.8 | fgh | 82.5 | a-d |
| Serenade Soil 1.34SC 5.5 fl oz (A). | 56.1 | abc | 17.9 | a | 4.5 | a-g | 30.0 | c-g | 11.6 | b-h | 82.0 | a-e |
| Proline 480SC 0.33 fl oz (B)…….. | | | | | 4.0 | b-g | 37.5 | b-g | 11.3 | b-h | 77.5 | b-e |
| Inoculated Check……. | | | | | 6.0 | a-g | 79.5 | a | 25.2 | a | 44.5 | g |
| Untreated Check…….. | 56.1 | abc | 18.0 | a | 8.3 | abc | 22.5 | g | 5.6 | h | 93.5 | a |

[a] Plant stand expressed as a percentage of the target population of 275 plants/100ft. row from a sample of 2 x 50 ft rows per plot.
[b] DAP = days after planting on 4 Apr.
[c] Relative area under the emergence progress curve from planting to 35 days after planting.
[d] Severity of crown and root rot was measured as an index calculated as described in the text.
[e] Application dates; A= 4 Apr; B= 10 May.
[f] Means followed by same letter are not significantly different at P = 0.05 (Fishers LSD).

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.55 | a | 21.73 | a | 62 | abc | 21.17 | a |
| | | | | | | | |
| 1.91 | a | 16.09 | a | 56.09 | abc | 17.89 | a |

# 2012 DRY BEAN YIELD TRIALS

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The bean breeding program initiated its fourth season on the new 320 acre research farm, Saginaw Valley Research & Extension Center (SVREC) near Frankenmuth in 2012. A total of 3,900 yield trial plots (24 tests) in 2012 and 1,977 single plant selections were made in the early generation nurseries. Yield trials at SVREC (Richville) included 56-entry standard navy test; two 36-entry standard black tests; 80-entry prelim navy tests; 42-entry prelim black test; 36-entry standard GN; 36-entry standard pinto test; 30-entry standard red/pink test; 16-entry prelim GN test; 90-entry prelim red/pink test; 16-entry FM test; 16-entry yield gain navy test; 20-entry yield gain pinto test; two 96-entry drought trials and 42-entry Co-op and regional test that includes pinto, GN, red and pinks. At Montcalm 64-entry bush cranberry test; 56-entry kidney test; 56-entry preliminary kidney test; 5-entry mayacoba test; 64-entry white mold test; 130-entry nitrogen fixation (BNF) test on campus; and two 36-entry certified organic trials in Tuscola county. All trials were direct harvested except for kidney, cranberry, drought, BNF and white mold trials that were rod pulled to measure plant biomass. Dry weather early in the season followed by ample rainfall delayed maturity at Frankenmuth but yields were above average. Plots at Montcalm had similar rainfall pattern but the stress was offset with supplemental irrigation and excellent yields were recorded in the kidney and cranberry trials. Screening for resistance to common bacterial blight (CBB) was very effective in these nurseries. White mold infection developed well in 2012 and genotypic differences were observed. Yield in cranberry beans approached 40 cwt and many lines with resistance to CBB were identified in both kidney and cranberry nurseries. Rust is becoming an increasing threat to navy, black and small red bean producers in Michigan, and we have identified resistance to race 22:2 in new navy, black and small red bean lines. In the drought and BNF trial plant biomass was determined on all plots prior to threshing. Root measurements were taken on the drought plots in Frankenmuth at flowering by digging plants and following protocol termed Shovelomics to measure root diameter, angle and vigor traits that may play a role in tolerating drought.

The season in Frankenmuth started out with limited rainfall following planting and only 0.2" fell during the first month through early July. Two sustaining rains of approximately 0.5" fell on July 3 and 18, followed by a major 2.0" rain on July 26/27. The crop maker was a rain of 2.4" on Aug 10/11which resulted in an overall summer rainfall of 2.53" lower than the 30-year average. The drought reversed maturities with full-season black and navy beans maturing ahead of pinto and great northerns. As a result of the early drought, many of the early-season lines double-set, whereas the longer-season blacks and navies matured normally ahead of pinto, and great northern trials. Many of the pinto, great northern and small red lines lost upright plant structure as a result of the regrowth making them difficult to harvest and reducing yields. The pink lines matured normally under these conditions and out-yielded the small red lines. Plots at Montcalm had more rainfall but the stress was offset with supplemental irrigation and excellent yields over 35 cwt/acre were recorded in the kidney and cranberry trials. White mold infection developed well in 2012 and exceeded the low levels observed in 2011.

The data for all tests are included in an attached section. Procedures and details on nursery establishment and harvest methods are outlined on the first page. Since the data collected on each test are basically the same, a brief discussion of each variable measured is presented below for clarification purposes.

1. Yield is clean seed weight reported in hundredweight per acre (cwt/acre) standardized to 18% moisture content. Dry beans are commercially marketed in units of 100 pounds (cwt).

2. Seed weight is a measure of seed size, determined by weighing in grams a pre-counted sample of 100 seeds, known as the 100-seed weight. To convert to seeds per 100g (10,000/100 seed wt); for example 100-seed weight of 50 converts to 200 seeds per 100 g (used in marketing).

3. Days to flower is the number of days from planting to when 50% of plants in a plot have one or more open flowers.

4. Days to maturity is the actual number of days from planting until date when all the plants in a plot have reached harvest maturity.

5. Lodging is scored from 1 to 5 where 1 is erect while 5 is prostrate or 100% lodged.

6. Height is determined at physiological maturity, from soil surface to the top of plant canopy, and is recorded in centimeters (cm).

7. Desirability score is a visual score given the plot at maturity that takes into consideration such plant traits as; moderate height, lodging resistance, good pod load, favorable pod to ground distance, uniformity of maturity, and absence of disease, if present in the nursery. The higher the score (from 1 to 9) the more desirable the variety, hence DS serves as a subjective selection index.

At the bottom of each table, the mean or average of all entries in a test is given to facilitate comparisons between varieties. In order to better interpret data, certain statistical factors are used. The LSD value refers to the Least Significant Difference between entries in a test. The LSD value is the minimum difference by which two entries must differ before they can be considered significantly different. Two entries differing in yield by 1 cwt/acre cannot be considered as performing significantly different if the LSD value is greater than 1 cwt/ acre. Such a statement is actually a statement of "probable" difference. We could be wrong once in 20 times ($p=0.05$) on the average, depending on the level of probability. The other statistic, Coefficient of Variation (CV), indicates how good the test was in terms of controlling error variance due to soil or other differences within a location. Since it is impossible to control all variability, a CV value of 10% or less implies excellent error control and is reflected in lower LSD values. Under the pedigree column, all released or named varieties are **bolded** and always preceded by a comma (,); when preceded by a slash (/), the variety was used only as a parent to produce that particular breeding line.

**Expt. 2101: Standard Navy Bean Yield Trial**

This 56-entry trial included standard commercial navy bean varieties, and advanced lines from the MSU breeding program, which carry the N-prefix. Yields ranged from 16.9 to 28.4 cwt/acre with a mean of 23.2 cwt/acre. The trial was fairly uniform and variability was well controlled (CV=11.7%) and the LSD needed for significance was 3.2 cwt/acre. Seven entries significantly out-yielded the test mean and included the Merlin variety from Coop Elevator. The group included N11283 that showed potential in 2011 and continues to perform well as did its sib N11284. Other lines of note are an early season line N11277 that dried down well. Varieties Rexeter, Medalist, Vista and Indi were all mid pack in terms of performance. Canning tests will be conducted on all MSU breeding lines before being considered for release. Overall performance of this test was disappointing compared to other seed classes as many of the lines did not mature well, remained green and exhibited the seed and pod infertility problem associated with the 'green spot' syndrome in this section of the farm.

**Expt. 2102: Standard Black Bean Yield Trial**

This 36-entry trial included the standard commercial black bean varieties and advanced breeding lines. Yields ranged from 24.1 to 35.6 cwt/acre with a test mean of 31 cwt/acre, significantly exceeding the yield potential of the advanced navy trial 2101. Variability was low in this test, (CV=7.5%) and the LSD was 2.7 cwt/acre. Seven entries significantly outyielded the test mean and these included Loreto. Zorro fell outside this group but was significantly higher yielding that Jaguar, Eclipse, Shania, Black Velvet, and T-39. The top yielding entry B10244 was the top yielder in 2011 and showed similar potential in 2012 with excellent combination of erectness, dry down and superior canning quality.

**Expt. 2103: Standard Black Bean Yield Trial**

This 36-entry trial included newer B11-black bean lines and check varieties compared to older entries in test 2102. Yields ranged from 23.2 to 34.5 cwt/acre with a mean of 28.9 cwt/acre. Variability was low in this test (CV=7.6%) and the LSD was 2.6 cwt/acre. Six lines significantly outyielded the test mean and these included Zorro which significantly outyielded Eclipse and Shania. The MSU lines have low DS scores but they carry additional disease resistance for CBB, rust and anthracnose so future advances of many of these lines will largely depend on canning quality of the entries.

**Expt. 2104: Preliminary Navy Bean Yield Trial**

This 80-entry trial included new navy bean lines and check varieties. Yields ranged from 15.1 to 34.1 cwt/acre with a mean of 23.8 cwt/acre. Variability was low in this 3-rep test (CV=7.7%) and the LSD was 2.5 cwt/acre and overall yields were better than advanced navy trial 2101. Twenty-five lines including Merlin and Indi significantly outyielded the test mean. Vista and Medalist were equivalent to the test mean. The top yielding entry was N11283 that was almost 3 cwt better than the second entry, underscoring its yield potential. It was 11 cwt better than its parent, Medalist. Future advances of many of the new breeding lines will largely depend on disease reactions and canning quality of the entries.

**Expt. 2105: Preliminary Black Bean Yield Trial**

This 42-entry trial included new black bean lines and check varieties. Yields ranged from 17.2 to 32.1 cwt/acre with a mean of 25.7 cwt/acre. Variability was moderate in this 3-rep test (CV=10.6%) and the LSD was 3.7 cwt/acre. Ten lines significantly outyielded the test mean and the top yielding entry B10244 was the same entry in test 2102. The two top entries were older lines not the newer lines with B12-prefix. Interestingly three groups of sibs fell in this group suggesting their high yield potential and consistent performance. The two checks, Shania and Zorro were similar in the mid group. Many of these lines carry anthracnose resistance but future advances of any new breeding lines will largely depend on confirmation of disease reactions and canning quality of the entries.

**Expt. 2106: Navy Bean Genetic Gain Yield Trial**

This small 16-entry trial included a group of old and new navy bean varieties to compare yield gain over the last century. Yields ranged from 17.4 to 26.8 cwt/acre with a mean of 22.9 cwt/acre. Variability was low in this test (CV=8.5%) and the LSD was 2.8 cwt/acre. Five lines significantly outyielded the test mean and included only varieties released since 1982. The mid group included varieties with a mixed history from Michelite (1938) to T9905 (mid 2000s). The last group had many determinate varieties but the major surprise was the overall poor performance of Avalanche released in 2010 in North Dakota.

**Expt. 2107: Standard Great Northern Bean Yield Trial**

This 36-entry trial included MSU great northern breeding lines (G-prefix) and standard commercial check varieties. The test ranged in yield from 14.0 to 32.1 cwt/acre with a mean yield of 25 cwt/acre. Variability was moderate (CV= 10.6%) resulting in a high LSD value (3.1 cwt/acre) needed for significance. Seven breeding lines significantly outperformed the test mean and included breeding line
*G08254 under consideration for release.* The second entry G08254 has been a top performer over the last four years and also significantly out-yielded the check variety Matterhorn which yielded similar to the test mean. In prior years a large number of lines exhibited severe 'fish-mouth' seed damage making them commercially unacceptable. This seed condition was not as obvious in 2012, but only those entries with larger seed size, improved dry seed quality and cracking resistance better than Matterhorn will be advanced in 2013. Similar to 2011, the maturity of GN lines was delayed due to the dry conditions and plants grew more vegetatively and lost some of their upright growth habit, exhibiting higher lodging scores (2.5-3.0) in 2012.

**Expt. 2108: Standard Pinto Bean Yield Trial**

This 36-entry trial included standard commercial pinto bean varieties and advanced breeding lines from the MSU breeding program with the P-prefix. The trial ranged in yield from 16.2 to 35.0 cwt/acre with a mean of 28.1 cwt/acre. Variability was low (CV=9.5%) in this trial and the LSD needed for significance was 3.1 cwt/acre. Nine entries significantly out-yielded the test mean and

these included the varieties Eldorado, La Paz, and Medicine Hat. Eldorado formerly tested as P07863 was the highest yielding pinto in the white mold trials in Montcalm in 2007 2008 and 2009 was 2nd in this test in 2010 and 1st in 2011. Pinto PT8-6 ranked second and shows potential. Other varieties Lariat exceeded the test mean whereas Santa Fe yielded at the bottom of the test Only those high-yielding entries with more upright architecture and canning quality equivalent to Othello will be advanced in 2012.

**Expt. 2109: Standard Pink and Small Red Bean Yield Trial**

This 30-entry trial included small red and pink breeding lines from MSU (R-S-prefix), in addition to standard commercial check varieties. The test ranged in yield from 21.6 to 31.4 cwt/acre with a mean yield of 26.7 cwt/acre. Variability was moderate (CV=10.2%) due to direct harvesting resulting in a LSD value (3.2 cwt/acre) for significance. Only four breeding lines including new Rosetta variety significantly outperformed the test mean. Sedona pink yielded above the test mean whereas, small red variety Merlot yielded significantly below the test mean. Merlot had an overall poor performance year combined with delayed maturity in many locations similar to 2011. Included in the test was the new small red variety Rio Rojo from NDSU that also performed below the test mean. The majority of small red lines were lower yielding and lack the canning quality of Merlot. Progress in small red breeding program has been limited by lack of useful variability.

**Expt. 2110: Flor de Mayo, Flor de Junio Bean Yield Trial**

This small 16-entry trial included new upright flor de mayo (FM) and flor de junio (FJ) bean lines along with check variety FM Eugenia from Mexico. This is the second year for this trial with FM/FJ lines bred for adaptation, upright architecture, yield and suitability for local production. Yields ranged from 18.3 to 33.6cwt/acre with a mean of 25.1 cwt/acre. Variability was moderate in this 3-rep test (CV=15.3%) and the LSD was 5.4 cwt/acre. As a result only one FJ line significantly out-yielded the test mean and it showed the overall best architecture traits. Lodging was very significant in this test as the plants produced excessive vegetative growth caused by the early season drought. The variety Eugenia was planted as a check for seed type and quality but it yielded at the bottom of the trial due in large part to poor adaptation. A few of top FJ/FM lines exhibited improved upright architecture, good dry down and high DS scores and future advances of these lines will largely depend on disease reactions, particularly to BCMV and the preferred color patterns of the dry FM/FJ seed.

**Expt. 2111: Preliminary Great Northern and Otebo Bean Yield Trial**

This small 16-entry trial included new great northern bean lines and otebo lines along with check varieties. Yields ranged from 16.0 to 31.5 cwt/acre with a mean of 24.3 cwt/acre. Variability was moderate in this 3-rep test (CV=10.3%) and the LSD was 3.5 cwt/acre. Four lines significantly out-yielded the test mean and these included three sibs from the same cross. New otebo lines in the G12900 series fell in the second group along with the Matterhorn check. These lines significantly outyielded the Fuji check variety. Future advances of many of the new breeding lines will largely depend on disease reactions and canning quality of the entries.

**Expt. 2112: Preliminary Red and Pink Bean Yield Trial**

This 90-entry trial included new small red and pink bean lines along with check varieties bred to ensure they had adequate levels of resistance to BCMV. Yields ranged from 10.3 to 36.7 cwt/acre with a mean of 29.1cwt/acre. Variability was moderate in this 3-rep test (CV=10.5%) and the LSD was 4.1 cwt/acre. Sixteen lines significantly out-yielded the test mean including the new pink variety, Rosetta and top yields at or above 35cwt were exceptional. Both checks Merlot and Sedona yielded below the test mean and Rio Rojo yielded above the test mean. This is the second season that Merlot has underperformed. The early drought in both years appears to have had a negative effect on Merlot, causing it to abort flowers, re-green, re-flower but never fully recover compared to other varieties. A number of top lines exhibited nice upright architecture, good dry down and high DS scores and future advances of many of the new breeding lines will largely depend on their reaction to BCMV, seed quality, color and canning quality of the entries.

**Expt. 2113: Pinto Bean Genetic Gain Yield Trial**

This small 20-entry trial included a group of old and new pinto bean varieties to compare yield gain over the last century. Yields ranged from 13.7 to 35.7 cwt/acre with a mean of 27.0 cwt/acre. Variability was low in this test (CV=9.7%) and the LSD was 3.6 cwt/acre. Six lines significantly outyielded the test mean and included a combination of both old and new varieties released since 1940s. The group included both old vine type-III and upright type-II varieties such as Lariat and Stampede. The mid group included varieties with a mixed history from the landrace common pinto to Sierra, first upright type-II (1989) and many of widely grown early-season varieties such as Othello. The major surprise was the overall poor performance of Buster which has been a consistent high performer over the years.

**Expt. 2114: Combined Midwest Regional Performance Nursery (MRPN) & Cooperative Dry Bean Nursery (CDBN) Yield Trial**

The MRPN is conducted annually in cooperation with North Dakota (ND-prefix), Nebraska (NE-prefix) and Colorado (CO-prefix) in order to test new pinto and great northern lines from all four programs and assess their potential in the different regions. The CDBN is a national trial and includes all classes but only medium-sized entries were included in this trial. The 42-entry trial ranged in yield from 16.1 to 36.0 cwt/acre with a mean of 25.2 cwt/acre. Variability was moderate (CV=10.6%) resulting in a LSD value (3.6 cwt/acre) for significance. As a result only five lines were significantly higher in yield than the test mean including the two new MSU varieties, Eldorado and Rosetta. Eldorado was the top yielding entry on the research farm in 2012. The top yielding entries were all pintos except Rosetta and included breeding line P08161 a line selected for resistance to potato leafhoppers. In the top group were pinto lines PT9-6 and a CO line from Colorado. The two new varieties Longs Peak pinto from Colorado and Rio Rojo from NSDU performed below the test mean. The longer-season vine cranberry varieties Bellagio were among the lowest yielding entries and do not perform at the level of pintos or great northern beans. As in test 2113, Buster was the lowest yielding entry suggesting that it does not tolerate drought stress. This cooperative trial continues to be valuable as it allows an evaluation of potential new lines prior to release in other states and confirmed performance of new MSU varieties released in 2012.

**Expts. 2115 & 2116: BeanCAP Drought Yield Trials**

Two 96-entry trials were conducted side by side one was irrigated and the other received only rainfall reported earlier in this report. The purpose of the trial was to evaluate drought stress on performance and root traits of diverse group of genotypes. Agronomic, yield, harvest index and root data were collected on both trials. The study is part of student research project supported by Beancap and USDA-NIFA grant. In the non irrigated trial, yields ranged from 14.2 to 36.7 cwt/acre with a mean of 27.3 cwt/acre. The trial was fairly uniform and variability was well controlled in this 3-rep test (CV=10.9%) and the LSD needed for significance was 4.0 cwt/acre. Fifteen entries significantly out-yielded the test mean and included varieties such as Eldorado, Kodiak, Medicine Hat, La Paz, Lariat, Orion, Shania and Othello two breeding lines PT7-2 and PR0340-3-3-1. The irrigated trial received supplemental water from two irrigations totaling 0.9" (7/23 and 8/3) and yields ranged from 16.3 to 34.1 cwt/acre with a mean of 26.0 cwt/acre. The trial was less uniform and variability in this 3-rep test was slightly higher (CV=11.2%) and the LSD needed for significance was 3.9 cwt/acre. Eleven entries significantly out-yielded the test mean and included some of the varieties such as Medicine Hat, La Paz, Lariat, Orion, PT7-2 and PR0340-3-3-1with the addition of Buster, Merlot, Sierra, and Domino. The major surprise was the higher performance in the non irrigated trial again suggesting that the delayed rainfall was sufficient to produce a successful bean crop.

**Expts. 2917 & 2918: Organic Dry Bean Yield Trials**

Two 36-entry navy and black trials were conducted on certified organic grower farms under organic production systems, with no fertilizer, no chemical seed treatments or weed or insect control, no harvest aid chemicals using seed inoculated with native Rhizobium to evaluate new breeding lines, and current varieties for potential production under this management system. Weeds were a major problem in test 2917 and part of the plot was damaged by flooding; insect (potato leaf hopper- PLH) damage was observed in both trials. In test 2917, yields ranged in yield from 4.2 to 24.9 cwt/acre with a mean of 15.1 cwt/acre. Variability was high (CV=20.8%) resulting in a LSD value (4.3 cwt/acre) for significance. Only five lines were significantly higher in yield than the test mean and this included the variety, Shania. In test 2918, yields ranged in yield from 6.1 to 18.1 cwt/acre with a mean of 13.3 cwt/acre. Variability was high (CV=18.2%) resulting in a LSD value (2.8 cwt/acre) for significance. Only four lines were significantly higher in yield than the test mean and only one line B11302 was repeated in both tests. Vista was the better navy bean variety and Shania was the better black bean check variety. The non-nodulating check R99 that cannot fix nitrogen yielded less than10 cwt in both tests again suggesting that nitrogen is a limiting factor under this management system. A group of high nitrogen fixating lines derived from Puebla 152 was included, but none of these lines showed potential and the group included the lowest yielding entry B11552 in both tests. Since organic growers may choose to save seed as organic seed is not widely available, resistance to seed-borne CBB would be an important criterion in their selection of bean varieties to grow. A number of the entries in this trial have high levels of resistance to CBB. The trial will be repeated in 2013 with a different mix of breeding lines.

**Expt. 2219: Standard Kidney Bean Yield Trial**

This 56-entry trial was conducted on the Montcalm Research Farm to compare the performance of standard and new light red kidney (LRK), dark red kidney (DRK) and white kidney (WK) bean varieties from MSU and CDBN under supplemental irrigation (7x total 3.75"). Part of the trial was damaged by flooding which reduced stands in the mid section of the trial, so a representative sample of 50 plants in each plot was harvested to determine yields. Yields ranged from 15.9 to 40.6 cwt/acre with a mean of 27.3 cwt/acre. Variability was moderate (CV=15%) resulting in a large LSD value (5.6 cwt/acre) needed for significance. Eleven breeding lines significantly out-yielded the test mean, including seven WK and 3 DRK lines and the new white kidney variety Snowdon. White kidney lines continue to out-yield red kidney lines in this trial with yields in excess of 35cwt, whereas the highest yielding LRK lines ranked just outside the top group. Varieties that yielded above the test mean included vine DRK Majesty, Red Hawk and Montcalm whereas Clouseau and Chinook LRK and Beluga WK were below the mean. One of the positive aspects of this trial was the high level of resistance to CBB in the higher yielding entries. Eleven of top 15 entries had CBB scores less than 2.0 compared to value of 5.0 for the CELRK check. A number of large seeded fabada types with seed size above 65g were identified and one line K11939 fell in the top group. Since canning quality is vital in kidney beans, only those DRK lines equivalent in canning quality to Red Hawk, LRK lines equal or better than CELRK and WK lines equivalent to Beluga will be advanced in 2013.

**Expt. 2220: Standard Bush Cranberry Bean Yield Trial**

This 64-entry trial was conducted on the Montcalm Research Farm to compare new and standard bush cranberry bean varieties under supplemental irrigation (7x total 3.75"). Yields ranged from 9.6 to 39 cwt/acre with a mean of 27.3 cwt/acre. Variability was moderate (CV=11.5%) in this 3-rep test and the LSD needed for significance was high (4.3 cwt/acre). Twelve lines significantly out-yielded the test mean, but the overall seed size was generally smaller than the Etna check (60g). CBB was rated on 1-5 scale and ranged from low of 1.3 to high of 5.0 many of the high-yielding lines expressed high levels of resistance and had values less than 2.0. Check variety Etna had a score of 5.0 and yielded at the test mean while Capri yielded below the test mean. The lowest yielding entry UCD0801 from California was not adapted. The trial represented a broad array of genotypes with different genetic background and a wide range in maturity, lodging resistance and yield potential among entries. Only those entries equivalent to Capri in seed size with improved yield, earlier maturity and canning quality will be advanced in 2013.

**Expt. 2221: Preliminary Kidney Bean Yield Trial**

This 56-entry trial was conducted on the Montcalm Research Farm to compare new and standard bush cranberry bean varieties under supplemental irrigation (7x total 3.75"). Yields ranged from 18.7 to 36.3 cwt/acre with a mean of 27.3 cwt/acre. Variability was moderate (CV=13.6%) in this 3-rep test and the LSD needed for significance was high (5 cwt/acre). Nine lines significantly out-yielded the test mean and the top entry was Snowdon. The top group included four WK, 3 DRK and one LRK line. The DRK lines were early maturing and showed good dry down a trait not common in DRK seed class. Seed size was generally smaller in many of the top yielding entries with the

exception of Snowdon (66g). CBB was rated on 1-5 scale and ranged from low of 1.5 to high of 5.0 indicating that many lines with values less than 2.0 had high levels of resistance. Similar to test 2220, Red Hawk and Montcalm yielded above the test mean, whereas Clouseau and Beluga yielded below the mean. Only those entries with improved yield and equivalent to Beluga and Red Hawk in seed size, earlier maturity and canning quality will be advanced in 2013.

**Expt. 2222: Mayacoba Bean Yield Trial**

This is the second year of testing this small 5-entry trial on the Montcalm Research Farm to identify potential new bush mayacoba (yellow) bean varieties that might be suited for production in Michigan. Yields ranged from 15.4 to 16.1 cwt/acre with a mean of 15.8 cwt/acre. Variability was high (CV=19.9%) in this 3-rep test and the LSD needed for significance was high (4.8 cwt/acre). As a result no lines significantly exceeded the test mean, largely as the result of high level of CBB infection. The lines under test were more erect than the Myasi check and all produced a significantly larger seed (46 vs. 36 g/100seeds). The low productivity of the lines in the trial underscores the difficulty of identifying a high yielding mayacoba seed for production in Michigan. Only those entries that retain and exhibit a bright yellow seed color under local conditions will be advanced in 2013.

**Expt. 2223: National White Mold Variety Yield Trial**

This 64-entry trial was conducted at Montcalm to evaluate a range of diverse dry bean varieties and breeding lines for reaction to white mold under natural field conditions. Genotypes included commercial navy and black bean cultivars, elite MSU lines, and new sources of white mold resistance entered as part of the National *Sclerotinia* Initiative (NSI) Nursery. Lines in the National trial were developed at MSU, OSU, CSU, Cornell, NDSU and USDA-WA. Entries were planted in two row plots with two rows of susceptible spreader variety Matterhorn between plots. Supplemental overhead irrigation was applied 9 times for a total of 4.75" to maintain adequate levels of moisture for favorable disease development at the critical flowering period. Natural white mold infection occurred across the entire trial and was extremely severe in certain plots. White mold was rated on a per plot basis on a scale of 1 to 9 based on disease incidence and severity where 9 had 90+% incidence and high severity index. White mold ranged from 18.5 to 99% and pressure was high compared to 2011. The test ranged in yield from 16.1 to 42.9 cwt/acre with a mean yield of 29.1 cwt/acre. Variability was moderate (CV=14.2%), thus a high LSD value (5.6 cwt/acre) was needed for significance. As a result eleven lines significantly out-yielded the test mean and included the new variety, Eldorado, and La Paz pinto varieties. The top group included new pinto 37-2 from USDA-WA for the third year and for the second year the new small red line ND080547 from NDSU was in the top group. Eldorado, top yielder in 2007, 2008 and 2009 continues to demonstrate superior yield performance under white mold pressure with low score (22.2%). For the first time, two GN lines fell in the top group included G08254 under consideration for release, whereas Matterhorn fell below the test mean with a white mold incidence of 66%. Included in trial were entries coded TL and TW that were previously identified as tolerant to white mold and these also continued to show good tolerance and yield potential. As in past years pintos and reds dominated the entries at the top of trial, followed by blacks, navy and pink lines and large seeded kidney were among the lowest yielding in the test. This was the third year that some of entries in NSI trial yielded above the test mean as many of the standard entries from NSI trial were among the lowest yielding lines in the past. Past experience using low-yielding white mold resistant germplasm as parents has not proved useful in breeding for

white mold resistance. Overall the trial confirmed results from previous years (susceptible check-Beryl rated 99% WM) and this trial will continue to be part of the breeding effort to improve tolerance to white mold.

**Expt. 2425: Biological Nitrogen Fixation – BNF Yield Trial**

A single 130-entry trial was conducted in East Lansing to measure nitrogen fixation and yield of RIL population grown in a low N (0.03%; normal range 0.05-0.1%) site as only those lines that fix more N will produce more yield under these conditions. The black bean population was developed from cross of Zorro with Puebla 152 line selected as a high nitrogen fixer. Yield ranged from 3.5 to 26.5 cwt/acre with a mean of 17.9 cwt/acre. Variability was high (CV=17.5%), and a LSD value of 4.2 cwt/acre was needed for significance. As a result fourteen lines significantly exceeded test mean and these lines exceeded the performance of the Zorro parent and check varieties. The top yielding entry ranked 8$^{th}$ in the same trial in 2011, but none of the other top-ten entries in 2011 repeated in 2012. One unexpected surprise was the presence of R99 in the top group. The trial was severely stressed due to the extreme drought in 2012 (July-Sept rainfall was 5.72" compared to normal 9.6" for the same period); in addition secondary problems of severe spider mite damage in sections of the field, selective feeding by deer and ground hogs exacerbated the problem. These problems are reflected in the low yields and high CV values. At harvest plant biomass was also recorded to measure harvest index (HI). Harvest index ranged from low of 6% in lowest yielding unadapted entries to 40% in higher yielding entries and these values were lower than in past years. The lower yielding entries tended to be late maturing entries combined with viney prostrate types that did not partition into the seed, hence lower HI. There is a strong correlation between HI and yield and results are similar to those observed in the Beancap drought trials 2115 and 2116. Selecting for high yield must be accompanied with partitioning into the seed. Bean lines with enhanced BNF would be useful trait for organic bean producers who cannot apply conventional fertilizers to increase yield.

**Early Generation Breeding Material grown in Michigan in 2012**

**F3 through F5 lines**

Navy and Black - 406 lines, 224 SSD
Pinto - 66 lines
GN - 158 lines
Pinks and Reds - 300 lines, 176 SSD
Kidneys (DR, LR, White) - 157 lines
Cranberry (bush, vine) - 193 lines
Yellow Eye – 14 lines

**F2 populations**

Navy and Black -219 populations
Pinto - 64 populations
GN - 60 populations
Pinks and Reds - 87 populations
Kidneys (DR, LR, White) – 95 populations
Cranberry (bush, vine) – 5 populations

**F1 populations:** 498 different crosses among ten contrasting seed types.

# 2012 DRY BEAN YIELD TRIALS

| EXPERIMENT | TITLE | PLANTING DATE | LOCATION | | ENTRIES | DESIGN | REPS | HARVEST METHOD |
|---|---|---|---|---|---|---|---|---|
| 2101 | STANDARD NAVY BEAN YIELD TRIAL | 06/06/12 | SVR&EC | FRANKENMUTH | 56 | REC. LATTICE | 4 | DIRECT HARVESTED |
| 2102 | STANDARD BLACK BEAN YIELD TRIAL-1 | 06/06/12 | SVR&EC | FRANKENMUTH | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2103 | STANDARD BLACK BEAN YIELD TRIAL-2 | 06/06/12 | SVR&EC | FRANKENMUTH | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2104 | PRELIMINARY NAVY BEAN YLD TRIAL | 06/06/12 | SVR&EC | FRANKENMUTH | 80 | ALPHA LATTICE | 3 | DIRECT HARVESTED |
| 2105 | PRELIMINARY BLACK BEAN YLD TRIAL | 06/06/12 | SVR&EC | FRANKENMUTH | 42 | REC. LATTICE | 3 | DIRECT HARVESTED |
| 2106 | NAVY GENETIC GAIN YLD TRIAL | 06/06/12 | SVR&EC | FRANKENMUTH | 16 | SQ. LATTICE | 3 | DIRECT HARVESTED |
| 2107 | STANDARD GREAT NORTHERN YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2108 | STANDARD PINTO BEAN YIELD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2109 | STANDARD PINK & SMALL RED YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 30 | REC. LATTICE | 4 | DIRECT HARVESTED |
| 2110 | PRELIM. FLOR DE MAYO YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 16 | SQ. LATTICE | 3 | DIRECT HARVESTED |
| 2111 | PRELIMINARY GREAT NORTHERN YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 16 | SQ. LATTICE | 3 | DIRECT HARVESTED |
| 2112 | PRELIM. PINK & SMALL RED YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 90 | ALPHA LATTICE | 3 | DIRECT HARVESTED |
| 2113 | PINTO GENETIC GAIN YLD TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 20 | REC. LATTICE | 3 | DIRECT HARVESTED |
| 2114 | MIDWEST & CO-OP. REGIONAL TRIAL | 06/07/12 | SVR&EC | FRANKENMUTH | 42 | REC. LATTICE | 3 | DIRECT HARVESTED |
| 2115 | IRRIGATED DROUGHT TRIAL | 06/12/12 | SVR&EC | FRANKENMUTH | 96 | REC. LATTICE | 3 | ROD PULLED |
| 2116 | NON-IRRIGATED DROUGHT TRIAL | 06/12/12 | SVR&EC | FRANKENMUTH | 96 | REC. LATTICE | 3 | ROD PULLED |
| 2917 | ORGANIC YIELD TRIAL-NAVY & BLACK | 06/12/12 | | CARO | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2918 | ORGANIC YIELD TRIAL-NAVY & BLACK | 06/15/12 | | WISNER | 36 | SQ. LATTICE | 4 | DIRECT HARVESTED |
| 2219 | STANDARD KIDNEY YIELD TRIAL | 06/13/12 | ENTRICAN | MONTCALM | 56 | REC. LATTICE | 3 | HAND PULLED |
| 2220 | STANDARD CRANBERRY YIELD TRIAL | 06/13/12 | ENTRICAN | MONTCALM | 64 | SQ. LATTICE | 3 | ROD PULLED |
| 2221 | PRELIMINARY BUSH KIDNEY YIELD TRIAL | 06/13/12 | ENTRICAN | MONTCALM | 56 | REC. LATTICE | 3 | ROD PULLED |
| 2222 | PRELIMINARY MAYACOBA YIELD TRIAL | 06/13/12 | ENTRICAN | MONTCALM | 5 | RCBD | 3 | HAND PULLED |
| 2223 | WHITE MOLD NATIONAL YIELD TRIAL | 06/14/12 | ENTRICAN | MONTCALM | 64 | SQ. LATTICE | 3 | ROD PULLED |
| 2225 | BNF YIELD TRIAL | 06/19/12 | CAMPUS | E.LANSING | 130 | ALPHA LATTICE | 3 | ROD PULLED |

SVR&EC: SAGINAW VALLEY RESEARCH & EXTENSION CENTER

PROCEDURE: PLANTED IN 4 ROW PLOTS, 20 FEET LONG, 20 INCH ROW WIDTH, 4 SEEDS/FOOT, 15 FOOT SECTION OF CENTER 2 ROWS WAS HARVESTED AT MATURITY.

FRANKENMUTH:FERTILIZER BROADCAST: 400 POUNDS OF 15-5-13 + S, ZN, MN, CU PRIOR TO PLANTING.
HERBICIDES APPLIED: 1.0 PT DUAL + 1.5 QT. EPTAM APPLIED PPI AND 1.0 PT PROWL PRE-EMERGE.
3 OZ. RAPTOR/0.75 PT REFLEX/1 PT BASAGRAN ON 7/11/12.
PESTICIDES APPLIED: 3.0 OZ. WARRIOR ON JULY 11.

ENTRICAN: FERTILIZER BROADCAST: 200 POUNDS OF 19-10-19 PRIOR TO PLANTING. 50 POUNDS 46-0-0 SIDE DRESSED ON JULY 24.
HERBICIDES APPLIED: 2 PT. SONALAN/1.25 QT EPTAM/2PT. DUAL PPI. 3 OZ. RAPTOR/0.75 PT REFLEX/1 PT BASAGRAN ON 7/13/12.
PESTICIDES APPLIED: 3.0 OZ. PROVINCE ON JULY 13.
IRRIGATION APPLIED: 4.75 INCHES ON WHITE MOLD TRIALS - 9 APPLICATIONS; 3.75 INCHES ON STANDARD YIELD TRIALS - 7 APPLICATIONS

E. LANSING: FERTILIZER: NONE.
HERBICIDES APPLIED: 2 PT. SONALAN + 1.25 QT EPTAM + 2PT. DUAL APPLIED PPI. 3 OZ. RAPTOR/0.75 PT REFLEX/1 PT BASAGRAN APPLIED 7/16/12.
PESTICIDES APPLIED: 4.0 OZ. WARRIOR ON JULY 16.

| EXPERIMENT 2101 STANDARD NAVY YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| N11284 | MEDALIST/N08003 | 39 | 28.4 | 18.3 | 45.0 | 99.0 | 1.0 | 50.5 | 4.5 |
| N11276 | N08010/N08007 | 52 | 27.3 | 18.7 | 50.0 | 97.0 | 1.0 | 49.5 | 4.5 |
| N11230 | N05311//BMD12/B04587 | 20 | 27.1 | 18.7 | 42.0 | 100.0 | 1.0 | 48.0 | 4.5 |
| N11283 | MEDALIST/N08003 | 34 | 26.9 | 18.4 | 44.0 | 100.0 | 1.5 | 54.5 | 6.0 |
| I11264 | COOP 03019, **MERLIN** | 1 | 26.9 | 19.6 | 45.0 | 102.0 | 2.0 | 50.5 | 4.0 |
| N11277 | N08010/N08007 | 47 | 26.9 | 20.5 | 48.0 | 97.0 | 1.0 | 51.0 | 6.0 |
| N11292 | N08006/MEDALIST | 43 | 26.4 | 17.3 | 46.0 | 100.0 | 1.0 | 54.5 | 4.5 |
| N11232 | N05311//BMD12/B04587 | 15 | 25.8 | 18.3 | 44.0 | 100.0 | 1.5 | 51.5 | 5.0 |
| N12471 | B09174/N09056 | 55 | 25.8 | 23.7 | 46.0 | 98.0 | 1.5 | 47.5 | 4.0 |
| N11238 | N07009//N05324/B04554 | 26 | 25.6 | 15.7 | 49.0 | 101.0 | 1.0 | 54.0 | 6.0 |
| N11298 | MEDALIST//B05054/B04588 | 36 | 25.5 | 19.7 | 46.0 | 99.0 | 1.0 | 49.0 | 4.0 |
| N11296 | MEDALIST//B05054/B04588 | 49 | 25.4 | 20.2 | 43.0 | 99.0 | 1.5 | 49.5 | 4.5 |
| I10103 | OAC 7-2, **OAC REXETER** | 56 | 25.3 | 20.1 | 44.0 | 103.0 | 2.0 | 52.0 | 4.0 |
| N11264 | N08003/MEDALIST | 38 | 25.1 | 20.0 | 42.0 | 99.0 | 2.0 | 49.0 | 4.5 |
| I08958 | Mayflower/Avanti, **MEDALIST** | 8 | 25.0 | 18.9 | 46.0 | 102.0 | 2.0 | 51.5 | 4.5 |
| N11282 | MEDALIST/N08003 | 40 | 24.8 | 18.4 | 44.0 | 101.0 | 2.0 | 53.5 | 4.0 |
| N11256 | N07009/MEDALIST | 41 | 24.6 | 18.3 | 48.0 | 98.0 | 1.0 | 49.5 | 4.5 |
| N11231 | N05311//BMD12/B04587 | 19 | 24.3 | 17.0 | 44.0 | 99.0 | 1.5 | 49.0 | 5.0 |
| N10109 | B05055/N05324 | 6 | 24.1 | 19.8 | 48.0 | 101.0 | 1.5 | 53.0 | 4.5 |
| N09104 | N05311/B05055 | 5 | 23.9 | 19.2 | 47.0 | 98.0 | 1.0 | 48.5 | 4.5 |
| N11225 | N05311*/B05044 | 11 | 23.9 | 18.1 | 49.0 | 101.0 | 1.5 | 51.5 | 4.0 |
| N09044 | N05311/X06121 | 9 | 23.8 | 17.5 | 44.0 | 100.0 | 1.0 | 51.0 | 5.0 |
| N11257 | N07009/MEDALIST | 42 | 23.8 | 19.9 | 49.0 | 100.0 | 1.0 | 53.0 | 5.0 |
| N11245 | N04158/B07554 | 23 | 23.8 | 19.2 | 47.0 | 99.0 | 1.0 | 47.0 | 4.0 |
| I92002 | C-20*3//GTS-0801/Seafarer, **VISTA** | 2 | 23.8 | 19.9 | 46.0 | 100.0 | 2.5 | 46.5 | 4.0 |
| I12301 | **INDI** | 3 | 23.7 | 20.3 | 44.0 | 98.0 | 1.0 | 51.0 | 4.5 |
| N11258 | N07009/MEDALIST | 35 | 23.6 | 19.5 | 49.0 | 100.0 | 1.0 | 53.5 | 4.0 |
| N10103 | N05319//N05311/N04109 | 4 | 23.5 | 20.5 | 43.0 | 100.0 | 1.0 | 53.5 | 5.0 |
| N11275 | N08010/N08007 | 46 | 23.4 | 19.2 | 44.0 | 101.0 | 1.5 | 51.5 | 4.0 |
| N11262 | N08003/B07554 | 37 | 23.4 | 22.8 | 45.0 | 102.0 | 2.0 | 50.5 | 4.5 |
| N11216 | N04158/B04265 | 10 | 23.4 | 21.8 | 44.0 | 101.0 | 2.0 | 48.5 | 4.0 |
| N11300 | MEDALIST//B05054/B04588 | 50 | 23.3 | 20.4 | 46.0 | 100.0 | 1.0 | 51.0 | 4.5 |
| N11289 | N08012/N08007 | 48 | 22.9 | 20.8 | 45.0 | 101.0 | 1.0 | 48.5 | 4.0 |
| N11228 | N05311//N07009/N05324 | 13 | 22.8 | 17.0 | 46.0 | 100.0 | 2.0 | 48.5 | 5.0 |
| N11226 | N05311*/B05044 | 12 | 22.7 | 17.4 | 50.0 | 102.0 | 1.0 | 53.5 | 4.0 |
| N11227 | N05311//N07009/N05324 | 16 | 22.7 | 19.2 | 45.0 | 99.0 | 2.0 | 48.0 | 4.5 |
| N11234 | N05311//N06705/B04588 | 17 | 22.3 | 20.5 | 45.0 | 100.0 | 1.5 | 48.0 | 4.0 |

| EXPERIMENT 2101 STANDARD NAVY YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| N11002 | N04164//N05311/B05044 | 31 | 22.3 | 19.7 | 43.0 | 99.0 | 1.0 | 52.0 | 4.5 |
| N11008 | B07554/N08007 | 30 | 21.9 | 19.0 | 46.0 | 102.0 | 1.0 | 52.5 | 4.0 |
| N11293 | N08006/MEDALIST | 54 | 21.8 | 20.8 | 45.0 | 102.0 | 1.5 | 53.5 | 5.0 |
| N11217 | N05324/N04158 | 28 | 21.6 | 19.4 | 50.0 | 102.0 | 1.5 | 52.0 | 4.5 |
| N11280 | AVALANCHE/N08007 | 44 | 21.6 | 21.3 | 45.0 | 102.0 | 2.0 | 52.5 | 4.0 |
| N11003 | N04164//N05311/B05044 | 27 | 21.6 | 20.3 | 44.0 | 101.0 | 1.5 | 53.0 | 4.0 |
| N11235 | N05311//N06705/B04588 | 29 | 21.3 | 20.6 | 43.0 | 99.0 | 1.0 | 48.0 | 3.5 |
| N11222 | N04164//N05311/B05044 | 32 | 21.1 | 19.2 | 47.0 | 100.0 | 2.0 | 49.0 | 4.0 |
| I08902 | **HYLAND T9905** | 7 | 21.1 | 19.8 | 44.0 | 100.0 | 2.0 | 47.0 | 4.0 |
| N11001 | N04164//N05311/B05044 | 25 | 20.4 | 18.7 | 45.0 | 101.0 | 1.0 | 51.5 | 4.5 |
| N11285 | N04152/N05346//N04141/N05317 | 45 | 20.3 | 18.4 | 45.0 | 103.0 | 1.5 | 51.5 | 4.0 |
| N11206 | N04158/N05311 | 18 | 20.2 | 19.5 | 46.0 | 102.0 | 2.0 | 51.5 | 4.0 |
| N11212 | N05311/B05055 | 22 | 20.0 | 18.7 | 46.0 | 100.0 | 1.5 | 51.0 | 5.0 |
| N11279 | N08010//B04349/B05044 | 51 | 20.0 | 18.9 | 45.0 | 100.0 | 1.5 | 47.5 | 4.0 |
| N11260 | N07009//B04349/B05044 | 53 | 20.0 | 16.3 | 47.0 | 101.0 | 1.5 | 51.5 | 4.0 |
| N11202 | N05324//N04109/N04158 | 14 | 19.7 | 21.4 | 43.0 | 102.0 | 2.0 | 49.5 | 3.0 |
| N11213 | N05346/B05055 | 24 | 18.7 | 20.3 | 46.0 | 102.0 | 1.0 | 46.0 | 3.5 |
| N11005 | B07055//B05044/N04158 | 33 | 17.8 | 17.4 | 43.0 | 100.0 | 2.0 | 46.0 | 3.5 |
| N11207 | N04158/N05311 | 21 | 16.9 | 20.0 | 48.0 | 102.0 | 1.5 | 51.5 | 4.0 |
| MEAN (56) | | | 23.2 | 19.4 | 45.4 | 100.3 | 1.5 | 50.5 | 4.4 |
| LSD (.05) | | | 3.2 | 1.1 | 1.0 | 2.3 | 0.7 | 2.3 | 0.5 |
| CV (%) | | | 11.7 | 4.7 | 1.3 | 1.4 | 28.0 | 2.7 | 6.6 |

| EXPERIMENT 2102 STANDARD BLACK YIELD TRIAL (1) | | | | | | | | PLANTED: 6/6/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| B10244 | B04610/N05346 | 12 | 35.6 | 22.2 | 46.0 | 101.0 | 1.0 | 54.5 | 6.0 |
| I10102 | Mackinac/Jaguar, **LORETO** | 1 | 35.4 | 21.1 | 46.0 | 101.0 | 3.0 | 48.0 | 4.0 |
| B11363 | B04644/B07554 | 28 | 34.9 | 21.0 | 45.0 | 100.0 | 1.0 | 50.0 | 5.0 |
| B10213 | B04587//ZORRO/DPC-1 | 13 | 34.5 | 20.1 | 46.0 | 101.0 | 1.5 | 52.5 | 5.0 |
| B10208 | N05324/B05055 | 16 | 34.1 | 23.4 | 44.0 | 101.0 | 1.0 | 51.0 | 4.5 |
| B11334 | N07009//B04349/B05044 | 29 | 34.0 | 19.3 | 43.0 | 99.0 | 1.0 | 51.5 | 5.5 |
| B10215 | B04587//ZORRO/DPC-1 | 15 | 33.9 | 19.9 | 47.0 | 100.0 | 1.0 | 50.0 | 5.0 |
| B04554 | B00103*/X00822, **ZORRO** | 6 | 33.6 | 20.2 | 48.0 | 102.0 | 2.0 | 54.0 | 5.0 |
| B10202 | N05311/X06121 | 24 | 32.9 | 22.8 | 44.0 | 100.0 | 1.0 | 53.5 | 5.0 |
| B11259 | N07009//B04349/B05044 | 36 | 32.3 | 19.5 | 45.0 | 103.0 | 1.5 | 50.5 | 4.0 |
| B09165 | B04554/B04587 | 10 | 32.1 | 18.9 | 46.0 | 102.0 | 1.5 | 54.0 | 6.0 |
| B11360 | B04644/B05066 | 30 | 31.9 | 21.5 | 42.0 | 101.0 | 2.0 | 48.0 | 4.0 |
| B09175 | N05311/B05055 | 2 | 31.8 | 24.2 | 46.0 | 103.0 | 2.0 | 54.0 | 4.5 |
| B10214 | B04587//ZORRO/DPC-1 | 17 | 31.7 | 19.9 | 46.0 | 101.0 | 2.0 | 53.0 | 5.0 |
| B11364 | B04644/B07554 | 34 | 31.4 | 23.0 | 45.0 | 100.0 | 1.0 | 52.5 | 5.5 |
| B11588 | I82054/B07554 | 8 | 31.4 | 21.2 | 47.0 | 104.0 | 2.0 | 48.0 | 4.0 |
| B10210 | N05324/B04431 | 14 | 31.4 | 24.0 | 44.0 | 104.0 | 2.0 | 54.0 | 4.5 |
| B11343 | B07554//ZORRO/B05044 | 27 | 31.4 | 19.8 | 44.0 | 100.0 | 2.5 | 48.5 | 4.0 |
| B09119 | B04554/X06127 | 7 | 31.1 | 19.5 | 47.0 | 100.0 | 1.0 | 51.5 | 4.5 |
| B95556 | B90211/N90616, **JAGUAR** | 5 | 30.9 | 19.9 | 47.0 | 101.0 | 1.0 | 50.0 | 4.5 |
| B11344 | B07554//ZORRO/B05044 | 35 | 30.8 | 19.0 | 47.0 | 100.0 | 2.0 | 48.0 | 4.0 |
| B10238 | ZORRO/B05055 | 21 | 30.8 | 19.0 | 47.0 | 101.0 | 1.0 | 50.5 | 4.5 |
| B10227 | B05055/N05324 | 22 | 30.7 | 22.4 | 45.0 | 103.0 | 2.0 | 49.5 | 4.0 |
| B10231 | B06311/N05311 | 23 | 30.4 | 17.0 | 47.0 | 100.0 | 1.0 | 49.0 | 4.0 |
| B10243 | B04610/N05346 | 19 | 30.4 | 18.5 | 48.0 | 103.0 | 2.0 | 53.0 | 4.0 |
| B11361 | B04644/B05066 | 32 | 30.0 | 20.2 | 45.0 | 102.0 | 2.0 | 50.5 | 3.5 |
| B11362 | B04644/B07554 | 33 | 29.9 | 24.2 | 44.0 | 99.0 | 2.0 | 48.5 | 4.0 |
| I03390 | ND9902621-2, **ECLIPSE** | 11 | 29.8 | 20.2 | 45.0 | 99.0 | 2.0 | 51.5 | 4.0 |
| B10225 | B04644//B05055/B05044 | 20 | 29.6 | 20.7 | 45.0 | 98.0 | 1.0 | 48.5 | 4.0 |
| B11375 | B07104/B04391 | 31 | 29.3 | 20.6 | 44.0 | 102.0 | 2.0 | 52.5 | 4.5 |
| I07116 | T-39/Midnight, **SHANIA** | 3 | 29.2 | 20.0 | 48.0 | 103.0 | 2.5 | 49.5 | 3.0 |
| B10201 | N05311/B05055 | 26 | 28.5 | 21.0 | 43.0 | 99.0 | 1.5 | 52.0 | 5.0 |
| I08907 | Midnight/Blackhawk, **BLACK VELVET** | 4 | 26.8 | 23.7 | 48.0 | 104.0 | 3.0 | 49.5 | 3.5 |
| I81066 | SEL-BTS,**T-39** | 9 | 24.8 | 21.9 | 44.0 | 103.0 | 4.0 | 40.5 | 3.0 |
| B10228 | B06311/B05039 | 25 | 24.2 | 22.0 | 45.0 | 103.0 | 2.0 | 47.5 | 4.0 |
| B10234 | B04644/B190 | 18 | 24.1 | 19.4 | 45.0 | 101.0 | 1.5 | 47.0 | 3.5 |
| MEAN (36) | | | 31.0 | 20.9 | 45.3 | 101.0 | 1.7 | 50.5 | 4.4 |
| LSD (0.05) | | | 2.7 | 1.4 | 1.4 | 1.8 | 0.5 | 2.5 | 0.6 |
| CV (%) | | | 7.5 | 5.7 | 1.8 | 1.0 | 17.9 | 2.9 | 7.4 |

| EXPERIMENT 2103 STANDARD BLACK YIELD TRIAL (2) | | | | | | | | PLANTED: 6/6/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| B09175 | N05311/B05055 | 2 | 34.5 | 24.6 | 46.0 | 102.0 | 2.0 | 53.0 | 4.5 |
| B11371 | B05055/B04587 | 11 | 33.0 | 21.5 | 45.0 | 101.0 | 2.0 | 51.5 | 4.5 |
| B11311 | B04587//ZORRO/DPC-1 | 22 | 32.8 | 19.1 | 47.0 | 102.0 | 1.5 | 51.0 | 5.0 |
| B04554 | B00103*/X00822, **ZORRO** | 8 | 31.9 | 18.4 | 47.0 | 101.0 | 2.0 | 51.5 | 5.0 |
| B11310 | B04587//ZORRO/DPC-1 | 10 | 31.8 | 22.1 | 46.0 | 100.0 | 2.0 | 49.0 | 4.0 |
| B11312 | B04587//B05070/B05044 | 6 | 31.8 | 20.1 | 46.0 | 103.0 | 2.0 | 50.5 | 4.0 |
| B11370 | B05055/B04265 | 24 | 31.4 | 18.6 | 44.0 | 99.0 | 1.5 | 47.5 | 4.0 |
| B10244 | B04610/N05346 | 1 | 31.4 | 21.7 | 46.0 | 100.0 | 1.0 | 54.0 | 6.0 |
| B11304 | N05324/B05055 | 20 | 31.3 | 21.4 | 44.0 | 100.0 | 2.0 | 48.5 | 4.5 |
| B11348 | B04644//ZORRO/B05044 | 34 | 30.9 | 20.4 | 46.0 | 98.0 | 1.5 | 49.5 | 4.5 |
| B11302 | N05311//B05055/B05053 | 7 | 30.6 | 21.1 | 44.0 | 99.0 | 2.0 | 51.5 | 4.5 |
| B11356 | JAGUAR/B04644 | 19 | 30.1 | 19.2 | 45.0 | 101.0 | 2.0 | 51.5 | 4.5 |
| B11338 | N08007//B04349/B05044 | 23 | 30.1 | 17.8 | 46.0 | 100.0 | 1.0 | 51.5 | 5.0 |
| B11285 | N04152/N05346//N04141/N05317 | 32 | 30.0 | 19.2 | 46.0 | 101.0 | 2.0 | 49.0 | 4.5 |
| B11372 | B05055/B04587 | 14 | 29.8 | 20.6 | 48.0 | 99.0 | 2.5 | 49.5 | 5.0 |
| I03390 | ND9902621-2, **ECLIPSE** | 26 | 29.2 | 19.2 | 44.0 | 98.0 | 1.0 | 49.0 | 4.0 |
| B11305 | N05324/N04158 | 5 | 29.1 | 19.1 | 46.0 | 101.0 | 1.0 | 51.0 | 4.5 |
| B11309 | B04587//ZORRO/B05055 | 9 | 28.5 | 19.5 | 44.0 | 100.0 | 1.0 | 49.5 | 5.0 |
| B01261 | Black Magic/Shiny Crow | 31 | 28.5 | 19.7 | 52.0 | 100.0 | 3.5 | 44.5 | 3.0 |
| B11306 | B04591/ZORRO | 12 | 28.5 | 18.3 | 46.0 | 103.0 | 2.0 | 53.0 | 4.5 |
| B11313 | B04644//B04349/B05044 | 17 | 28.4 | 18.8 | 43.0 | 97.0 | 1.5 | 47.0 | 4.0 |
| B11341 | N05311//N07009/N05324 | 13 | 28.3 | 18.7 | 43.0 | 99.0 | 2.0 | 47.5 | 4.5 |
| B11004 | N05324//N05311/B05044 | 30 | 28.3 | 21.4 | 42.0 | 102.0 | 2.0 | 49.0 | 3.0 |
| B11316 | B05052//B05044/B04588 | 33 | 27.9 | 20.0 | 45.0 | 99.0 | 1.5 | 48.5 | 4.0 |
| B11329 | B04644/B04391 | 25 | 27.3 | 20.2 | 43.0 | 101.0 | 1.0 | 51.5 | 4.5 |
| B11369 | B05054/B04588//B07554 | 28 | 27.2 | 19.9 | 47.0 | 101.0 | 1.5 | 48.5 | 4.0 |
| B11322 | B05055/B04644 | 35 | 27.0 | 17.8 | 43.0 | 98.0 | 1.0 | 48.5 | 5.0 |
| I07116 | T-39/Midnight, **SHANIA** | 3 | 26.9 | 17.7 | 46.0 | 100.0 | 2.0 | 47.5 | 3.0 |
| B11352 | B04644//B06311/B05044 | 15 | 26.8 | 20.4 | 44.0 | 98.0 | 1.5 | 47.5 | 4.5 |
| B11314 | B04644//B04349/B05044 | 27 | 26.8 | 22.0 | 42.0 | 98.0 | 1.5 | 48.0 | 4.0 |
| B11350 | B04644//B05055/B05044 | 21 | 26.3 | 20.5 | 46.0 | 98.0 | 1.0 | 47.5 | 4.0 |
| B11315 | B04644//B05055/B04587 | 18 | 25.9 | 19.6 | 42.0 | 98.0 | 1.0 | 47.0 | 4.0 |
| B11351 | B04644//B05055/B05044 | 16 | 25.9 | 18.5 | 44.0 | 98.0 | 1.5 | 46.5 | 4.0 |
| B11307 | N05311/B04587 | 29 | 25.6 | 22.2 | 43.0 | 99.0 | 1.5 | 47.5 | 4.0 |
| B11355 | JAGUAR/B04644 | 4 | 23.8 | 17.0 | 44.0 | 98.0 | 1.0 | 48.0 | 2.5 |
| B11345 | B07554//B05044 /N04158 | 36 | 23.2 | 18.9 | 43.0 | 101.0 | 2.0 | 49.0 | 4.0 |
| MEAN (36) | | | 28.9 | 19.9 | 44.9 | 99.6 | 1.6 | 49.3 | 4.3 |
| LSD (0.05) | | | 2.6 | 1.4 | 1.9 | 2.9 | 0.7 | 2.7 | 0.8 |
| CV (%) | | | 7.6 | 6.0 | 2.5 | 1.7 | 23.3 | 3.3 | 11.0 |

| EXPERIMENT 2104 PRELIMINARY NAVY YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** | **R73*** |
| N11283 | MEDALIST/N08003 | 75 | 34.1 | 19.4 | 47.0 | 100.0 | 2.5 | 50.0 | 4.5 | |
| I11264 | COOP 03019, **MERLIN** | 77 | 31.3 | 20.1 | 45.0 | 102.0 | 2.0 | 49.5 | 4.0 | |
| N11298 | MEDALIST//B05054/B04588 | 76 | 31.1 | 20.0 | 47.0 | 99.0 | 1.0 | 51.5 | 5.0 | |
| N12468 | N08010//B04349/B05044 | 68 | 30.4 | 18.9 | 49.0 | 100.0 | 2.0 | 50.5 | 4.0 | 6R |
| N12443 | N09060/N09175 | 43 | 30.3 | 21.7 | 50.0 | 102.0 | 2.0 | 51.0 | 4.5 | 6R |
| N12442 | N09060/N09175 | 42 | 29.6 | 22.9 | 50.0 | 101.0 | 1.5 | 54.0 | 5.0 | 6R |
| N12453 | N09065/N09050 | 53 | 29.0 | 22.6 | 45.0 | 101.0 | 1.5 | 50.0 | 4.5 | 6R |
| N12447 | B09174/N09056 | 47 | 28.5 | 22.1 | 49.0 | 102.0 | 2.5 | 49.5 | 4.0 | 2S, 5R |
| N12441 | N09060/N09175 | 41 | 28.3 | 22.8 | 49.0 | 102.0 | 2.0 | 52.0 | 4.0 | 6R |
| N12466 | N08010/N08007 | 66 | 28.2 | 18.9 | 49.0 | 99.0 | 1.5 | 52.5 | 4.5 | 6R |
| N12435 | N09056/N09175 | 35 | 27.9 | 21.2 | 45.0 | 101.0 | 2.5 | 47.5 | 4.5 | 6R |
| N11228 | N05311//N07009/N05324 | 73 | 27.4 | 18.0 | 47.0 | 100.0 | 2.5 | 47.5 | 4.5 | |
| N11258 | N07009/MEDALIST | 74 | 27.4 | 19.9 | 47.0 | 100.0 | 2.0 | 52.5 | 5.0 | |
| N12411 | C-20/N09011 | 11 | 27.3 | 21.7 | 45.0 | 99.0 | 3.0 | 44.0 | 3.0 | 6S |
| N12438 | N09056/N09175 | 38 | 27.2 | 21.2 | 44.0 | 100.0 | 2.0 | 53.0 | 5.0 | 6R |
| N12405 | N04158//B04644/X08103 | 5 | 26.9 | 19.4 | 44.0 | 101.0 | 1.0 | 50.5 | 5.0 | 6S |
| N12439 | N09056/N09175 | 39 | 26.7 | 21.0 | 48.0 | 101.0 | 2.0 | 49.5 | 4.0 | 6R |
| N12461 | Eclipse/N09056 | 61 | 26.7 | 20.1 | 41.0 | 97.0 | 2.5 | 46.5 | 4.0 | 6R |
| N12463 | Eclipse/N09056 | 63 | 26.7 | 21.2 | 47.0 | 100.0 | 2.0 | 48.5 | 4.0 | 1S, 5R |
| N12437 | N09056/N09175 | 37 | 26.7 | 16.0 | 47.0 | 103.0 | 2.0 | 51.0 | 4.0 | 6R |
| I12301 | **INDI** | 80 | 26.6 | 20.8 | 44.0 | 98.0 | 1.0 | 52.0 | 4.5 | |
| N12436 | N09056/N09175 | 36 | 26.6 | 21.6 | 46.0 | 101.0 | 2.0 | 51.5 | 4.5 | 6R |
| N11226 | N05311*/B05044 | 72 | 26.5 | 18.0 | 50.0 | 103.0 | 1.5 | 54.5 | 4.5 | |
| N12451 | N07009//G07309/G08274 | 51 | 26.4 | 31.4 | 40.0 | 98.0 | 3.5 | 44.5 | 3.0 | 6S |
| N11216 | N04158/B04265 | 71 | 26.4 | 21.6 | 46.0 | 102.0 | 3.0 | 49.0 | 4.0 | |
| N12458 | B09174/N09056 | 58 | 26.2 | 18.6 | 46.0 | 97.0 | 2.5 | 48.0 | 4.0 | 3S, 2R |
| I92002 | C-20*3//GTS-0801/Seafarer, **VISTA** | 78 | 26.2 | 19.5 | 46.0 | 101.0 | 2.5 | 47.5 | 4.0 | |
| N12467 | N08010/N08007 | 67 | 26.1 | 18.9 | 50.0 | 100.0 | 2.5 | 49.5 | 4.0 | 5R |
| N12456 | B09174/N09056 | 56 | 26.1 | 20.7 | 43.0 | 100.0 | 2.5 | 47.5 | 4.0 | 6S |
| N12446 | B07554//X08106/X08102 | 46 | 25.6 | 19.9 | 44.0 | 99.0 | 1.5 | 48.0 | 4.0 | 6R |
| N12412 | C-20/N09011 | 12 | 25.3 | 22.8 | 44.0 | 99.0 | 3.0 | 46.0 | 3.0 | 6S |
| N12457 | B09174/N09056 | 57 | 25.3 | 20.8 | 43.0 | 101.0 | 2.0 | 50.0 | 4.0 | 2S, 4R |
| N12449 | N04158//B04644/X08103 | 49 | 25.3 | 24.8 | 43.0 | 102.0 | 1.5 | 47.0 | 4.0 | 1S, 6R |
| N12410 | C-20/N09011 | 10 | 25.2 | 20.5 | 48.0 | 101.0 | 3.0 | 45.5 | 3.0 | 6S |
| N12454 | B09174/N09056 | 54 | 25.1 | 20.5 | 44.0 | 101.0 | 2.0 | 51.0 | 4.5 | 6S |
| N12465 | N08007//B05054/B04588 | 65 | 25.0 | 19.9 | 47.0 | 104.0 | 2.0 | 52.5 | 4.5 | 5R |
| N12469 | Laker/N08007 | 69 | 24.9 | 21.4 | 48.0 | 99.0 | 2.5 | 46.5 | 4.0 | 6R |
| N12406 | N04158//B04644/X08103 | 6 | 24.8 | 20.4 | 47.0 | 102.0 | 1.0 | 51.5 | 4.5 | 6S |
| N12460 | Eclipse/N09056 | 60 | 24.7 | 19.8 | 43.0 | 97.0 | 2.0 | 46.5 | 4.0 | 6R |
| N12462 | Eclipse/N09056 | 62 | 24.5 | 19.3 | 46.0 | 101.0 | 2.5 | 48.5 | 4.0 | 6R |

| EXPERIMENT 2104 PRELIMINARY NAVY YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** | **R73*** |
| N12459 | B09174/N09056 | 59 | 24.4 | 19.8 | 44.0 | 101.0 | 1.5 | 49.0 | 4.0 | 2S, 4R |
| N12440 | N09056/N09175 | 40 | 24.3 | 21.8 | 47.0 | 102.0 | 1.5 | 48.0 | 4.0 | 6R |
| N12425 | N05324/N09060 | 25 | 23.9 | 22.4 | 49.0 | 105.0 | 1.0 | 49.5 | 3.5 | 5R |
| N12455 | B09174/N09056 | 55 | 23.3 | 21.0 | 49.0 | 103.0 | 1.5 | 51.5 | 3.5 | 6S |
| N12452 | N07009//G07309/G08274 | 52 | 23.3 | 26.3 | 40.0 | 99.0 | 3.0 | 45.5 | 3.0 | 6S |
| N12464 | N04158//N04141/N05317 | 64 | 23.2 | 20.7 | 47.0 | 104.0 | 2.5 | 53.0 | 3.5 | 6R |
| I08958 | Mayflower/Avanti, **MEDALIST** | 79 | 23.1 | 19.6 | 45.0 | 104.0 | 2.5 | 48.5 | 3.0 | |
| N12448 | N04158//B04644/X08103 | 48 | 22.9 | 24.8 | 47.0 | 99.0 | 1.5 | 49.0 | 4.0 | 4S, 4R |
| N12450 | N06705//Laker/N08007 | 50 | 22.7 | 21.3 | 46.0 | 105.0 | 2.0 | 50.0 | 3.0 | 4S, 4R |
| N12434 | N09056/N09175 | 34 | 22.7 | 19.6 | 44.0 | 105.0 | 2.0 | 48.5 | 3.5 | 6R |
| N12408 | N07009//G07309/G08274 | 8 | 22.6 | 21.1 | 44.0 | 104.0 | 1.5 | 49.5 | 4.0 | 6R |
| N12402 | N04158//B04644/X08103 | 2 | 22.4 | 22.1 | 49.0 | 102.0 | 2.0 | 49.5 | 4.0 | 6S |
| N12424 | N05324/N09034 | 24 | 22.4 | 17.7 | 46.0 | 101.0 | 2.0 | 50.5 | 4.0 | 6S |
| N12423 | N05324/N09034 | 23 | 21.9 | 18.0 | 42.0 | 101.0 | 1.5 | 50.0 | 4.5 | 6S |
| N12409 | N07009//G07309/G08274 | 9 | 21.9 | 25.4 | 42.0 | 98.0 | 3.0 | 46.5 | 3.5 | 6R |
| N12422 | N05324/N09034 | 22 | 21.8 | 16.6 | 47.0 | 101.0 | 1.0 | 50.0 | 3.0 | 6S |
| N12413 | C-20/N09011 | 13 | 21.5 | 19.4 | 47.0 | 105.0 | 2.0 | 52.0 | 3.5 | 6S |
| N12420 | N05324/N09034 | 20 | 21.2 | 24.8 | 48.0 | 105.0 | 3.0 | 46.5 | 3.0 | 6S |
| N12428 | N09010/N09002 | 28 | 21.1 | 22.0 | 50.0 | 105.0 | 1.5 | 53.5 | 4.0 | 6S |
| N12415 | C-20/N09011 | 15 | 21.0 | 20.4 | 47.0 | 105.0 | 2.5 | 50.5 | 3.5 | 6S |
| N12416 | C-20/N09011 | 16 | 20.9 | 20.9 | 47.0 | 104.0 | 2.5 | 48.0 | 3.0 | 6S |
| N12414 | C-20/N09011 | 14 | 20.4 | 20.3 | 45.0 | 103.0 | 3.0 | 45.0 | 3.0 | 6S |
| N12430 | N09010/N09002 | 30 | 20.3 | 21.7 | 44.0 | 101.0 | 1.5 | 48.0 | 4.0 | 6S |
| N12418 | C-20/N09011 | 18 | 20.3 | 21.8 | 48.0 | 103.0 | 2.0 | 51.0 | 3.5 | 6S |
| N12401 | N04158//B04644/X08103 | 1 | 20.2 | 19.5 | 48.0 | 102.0 | 1.5 | 47.5 | 4.0 | 6S |
| N12407 | N07009//G07309/G08274 | 7 | 19.9 | 20.9 | 42.0 | 102.0 | 1.5 | 48.5 | 3.0 | 6S |
| N12470 | B07554/N08007 | 70 | 19.7 | 20.3 | 47.0 | 102.0 | 2.0 | 53.0 | 4.5 | 6S |
| N12404 | N04158//B04644/X08103 | 4 | 19.5 | 19.6 | 48.0 | 103.0 | 1.0 | 50.0 | 4.0 | 6S |
| N12421 | N05324/N09034 | 21 | 18.5 | 21.1 | 46.0 | 105.0 | 1.5 | 52.5 | 4.0 | 6S |
| N12417 | C-20/N09011 | 17 | 18.4 | 19.3 | 46.0 | 104.0 | 1.5 | 54.5 | 3.5 | 6S |
| N12432 | N09034/N09010 | 32 | 18.4 | 19.0 | 42.0 | 101.0 | 2.0 | 49.5 | 4.0 | 6S |
| N12431 | N09010/N09002 | 31 | 18.3 | 20.8 | 48.0 | 101.0 | 2.0 | 50.0 | 4.0 | 6S |
| N12419 | N05324/N09034 | 19 | 18.2 | 20.3 | 48.0 | 104.0 | 1.5 | 52.5 | 3.0 | 6S |
| N12445 | Avalanche/N09045 | 45 | 17.8 | 19.4 | 44.0 | 104.0 | 1.5 | 51.5 | 4.0 | 6R |
| N12433 | N09043/N09065 | 33 | 17.6 | 20.6 | 43.0 | 101.0 | 1.5 | 47.5 | 3.0 | 6S |
| N12429 | N09010/N09002 | 29 | 17.4 | 21.9 | 48.0 | 103.0 | 1.0 | 53.0 | 4.0 | 6S |
| N12403 | N04158//B04644/X08103 | 3 | 16.9 | 24.0 | 50.0 | 105.0 | 2.0 | 50.0 | 3.0 | 6S |
| N12426 | N05324/N09067 | 26 | 16.3 | 21.6 | 49.0 | 106.0 | 2.5 | 50.5 | 3.5 | 6R |
| N12444 | Avalanche/N09045 | 44 | 15.9 | 20.5 | 48.0 | 105.0 | 1.5 | 51.0 | 3.5 | 4S, 2R |
| N12427 | N05324/N09067 | 27 | 15.1 | 25.1 | 43.0 | 105.0 | 2.0 | 50.0 | 3.0 | 6R |
| MEAN (80) | | | 23.8 | 20.9 | 45.9 | 101.4 | 2.0 | 49.7 | 3.9 | |
| LSD (0.05) | | | 2.5 | 1.1 | 2.0 | 2.3 | 0.5 | 3.1 | 0.8 | |
| CV (%) | | | 7.7 | 4.0 | 2.6 | 1.3 | 15.4 | 3.7 | 12.2 | |

| EXPERIMENT 2105 PRELIMINARY BLACK YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | R73* |
| B10244 | B04610/N05346 | 40 | 32.1 | 20.0 | 48.0 | 101.0 | 2.0 | 56.6 | 5.0 | |
| B09175 | N05311/B05055 | 39 | 31.0 | 24.3 | 47.0 | 101.0 | 1.9 | 56.6 | 5.0 | |
| B12709 | B07554//Jaguar/B07554 | 9 | 31.0 | 20.7 | 49.0 | 101.0 | 1.6 | 55.3 | 5.3 | 6R |
| B12720 | B09175/Eclipse | 20 | 30.5 | 23.3 | 48.0 | 98.0 | 2.0 | 56.4 | 6.0 | 6R |
| B12721 | B09175/Eclipse | 21 | 30.3 | 23.2 | 48.0 | 95.0 | 0.9 | 55.6 | 6.0 | 6R |
| B12707 | B07554//X08106/X08102 | 7 | 29.9 | 21.8 | 48.0 | 101.0 | 1.4 | 55.1 | 5.3 | 6R |
| B12712 | B07554//Jaguar/B07554 | 12 | 29.8 | 19.7 | 48.0 | 102.0 | 1.0 | 57.1 | 5.7 | 6R |
| B12710 | B07554//Jaguar/B07554 | 10 | 29.5 | 21.1 | 47.0 | 100.0 | 1.3 | 56.5 | 6.0 | 6R |
| B12708 | B07554//X08106/X08102 | 8 | 29.5 | 20.9 | 48.0 | 101.0 | 1.4 | 55.9 | 5.7 | 6R |
| B12724 | B09184/B09135 | 24 | 29.4 | 20.6 | 47.0 | 102.0 | 2.0 | 57.5 | 5.3 | 6R |
| B12715 | Zorro/N09056 | 15 | 28.8 | 19.1 | 47.0 | 101.0 | 1.6 | 52.0 | 4.3 | 6R |
| B12713 | B07554//Jaguar/B07554 | 13 | 28.8 | 21.1 | 48.0 | 101.0 | 1.3 | 56.8 | 5.7 | 6R |
| B12728 | B09193/B09184 | 28 | 28.7 | 19.8 | 43.0 | 98.0 | 1.6 | 48.9 | 4.0 | 6R |
| B12716 | B09128/Eclipse | 16 | 28.6 | 18.3 | 45.0 | 97.0 | 1.1 | 54.1 | 6.0 | 6R |
| B12736 | Eclipse/N09056 | 36 | 28.6 | 20.0 | 49.0 | 99.0 | 2.0 | 55.1 | 5.0 | 6S |
| B12723 | B09184/B09135 | 23 | 28.4 | 20.1 | 47.0 | 102.0 | 1.6 | 54.0 | 5.0 | 6R |
| B12706 | B07554//X08106/X08102 | 6 | 28.2 | 20.6 | 48.0 | 102.0 | 1.4 | 57.3 | 5.7 | 6R |
| I07116 | T-39/Midnight, **SHANIA** | 42 | 27.6 | 19.2 | 49.0 | 102.0 | 2.0 | 54.4 | 4.0 | |
| B12729 | B09201/B09135 | 29 | 27.4 | 17.9 | 46.0 | 101.0 | 1.4 | 54.5 | 5.0 | 6S |
| B12711 | B07554//Jaguar/B07554 | 11 | 27.4 | 19.6 | 48.0 | 102.0 | 1.4 | 57.6 | 5.7 | 6R |
| B04554 | B00103*/X00822, **ZORRO** | 41 | 27.2 | 19.3 | 50.0 | 101.0 | 2.0 | 55.8 | 5.0 | |
| B12734 | Eclipse/N09056 | 34 | 26.5 | 20.6 | 48.0 | 99.0 | 1.6 | 53.3 | 4.7 | 6R |
| B12704 | B05066//Jaguar/B07554 | 4 | 26.0 | 18.6 | 49.0 | 99.0 | 1.1 | 52.7 | 4.7 | 6S |
| B12702 | B05066//Jaguar/B07554 | 2 | 25.1 | 19.0 | 48.0 | 101.0 | 2.0 | 54.8 | 5.3 | 6S |
| B12732 | B09201/B09197 | 32 | 24.9 | 18.7 | 50.0 | 103.0 | 1.7 | 54.0 | 4.7 | 6R |
| B12735 | B09135/B09201 | 35 | 24.7 | 20.9 | 49.0 | 102.0 | 2.1 | 54.2 | 4.7 | 2S, 4R |
| B12701 | B05066//Jaguar/B07554 | 1 | 24.2 | 19.7 | 48.0 | 100.0 | 1.4 | 54.1 | 5.0 | 6S |
| B12727 | B09184/B09202 | 27 | 24.1 | 19.2 | 46.0 | 101.0 | 2.0 | 50.7 | 4.3 | 6R |
| B12703 | B05066//Jaguar/B07554 | 3 | 24.1 | 19.1 | 48.0 | 98.0 | 1.3 | 52.9 | 4.7 | 6S |
| B12726 | B09184/B09201 | 26 | 22.4 | 16.7 | 48.0 | 100.0 | 1.9 | 50.5 | 4.0 | 6R |
| B12738 | B05055/B04265 | 38 | 22.3 | 21.7 | 45.0 | 104.0 | 1.9 | 57.2 | 4.0 | 6R |
| B12719 | B09135/B09201 | 19 | 22.2 | 18.0 | 48.0 | 103.0 | 2.4 | 51.9 | 4.7 | 6R |
| B12717 | B09135/B09201 | 17 | 21.8 | 17.8 | 49.0 | 102.0 | 2.0 | 53.8 | 4.7 | 6R |
| B12737 | B05055/B04265 | 37 | 21.5 | 20.7 | 44.0 | 103.0 | 1.6 | 54.7 | 4.7 | 6R, 1S |
| B12722 | B09184/B09135 | 22 | 21.3 | 20.3 | 48.0 | 103.0 | 1.7 | 53.4 | 4.3 | 6R |
| B12725 | B09184/B09135 | 25 | 21.1 | 18.4 | 49.0 | 103.0 | 2.0 | 55.1 | 4.3 | 6R |
| B12718 | B09135/B09201 | 18 | 20.8 | 19.2 | 45.0 | 100.0 | 2.0 | 52.1 | 4.3 | 6R |
| B12705 | B07554//X08106/X08102 | 5 | 20.1 | 18.6 | 48.0 | 99.0 | 1.0 | 53.6 | 5.3 | 6R |
| B12714 | Zorro/N09056 | 14 | 20.1 | 20.7 | 51.0 | 101.0 | 2.9 | 47.1 | 4.0 | 6R |
| B12733 | Eclipse/B09182 | 33 | 19.5 | 18.7 | 48.0 | 96.0 | 1.0 | 48.3 | 4.3 | 6S |
| B12731 | B09201/B09197 | 31 | 17.4 | 16.5 | 52.0 | 104.0 | 3.1 | 49.6 | 3.7 | 6R |
| B12730 | B09201/B09197 | 30 | 17.2 | 17.0 | 50.0 | 103.0 | 3.6 | 46.7 | 4.0 | 6R |
| MEAN (42) | | | 25.7 | 19.8 | 47.9 | 100.8 | 1.8 | 53.9 | 4.9 | |
| LSD (0.05) | | | 3.7 | 1.4 | 2.4 | 1.6 | 0.5 | 2.2 | 0.1 | |
| CV (%) | | | 10.6 | 5.2 | 2.9 | 1.1 | 22.4 | 3.0 | 2.1 | |

| EXPERIMENT 2106 NAVY GENETIC GAIN YIELD TRIAL | | | | | | | | PLANTED: 6/6/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| BC133 | Medalist | 6 | 26.8 | 17.7 | 44.0 | 104.0 | 2.0 | 51.5 | 4.3 |
| BC320 | Vista | 5 | 26.8 | 19.3 | 45.0 | 101.0 | 2.7 | 48.0 | 4.0 |
| BC086 | Seahawk | 12 | 26.4 | 22.0 | 43.0 | 101.0 | 4.1 | 41.3 | 3.3 |
| BC394 | Midland | 3 | 26.0 | 15.2 | 41.0 | 97.0 | 1.9 | 47.9 | 4.7 |
| BC066 | C-20 | 13 | 25.7 | 18.0 | 45.0 | 104.0 | 3.1 | 47.0 | 4.0 |
| BC068 | Mayflower | 4 | 25.2 | 20.3 | 47.0 | 101.0 | 0.9 | 56.3 | 5.0 |
| BC134 | Navigator | 9 | 24.7 | 19.7 | 44.0 | 100.0 | 1.1 | 54.4 | 5.0 |
| BC056 | Seafarer | 14 | 23.6 | 16.6 | 41.0 | 102.0 | 1.9 | 47.7 | 3.7 |
| BC354 | T9905 | 8 | 23.0 | 20.1 | 46.0 | 104.0 | 3.1 | 48.4 | 4.0 |
| BC054 | Michelite | 2 | 22.6 | 17.2 | 45.0 | 104.0 | 3.4 | 47.1 | 3.0 |
| BC065 | Bunsi | 16 | 20.8 | 19.4 | 42.0 | 104.0 | 3.3 | 44.8 | 3.3 |
| BC305 | Norstar | 7 | 20.8 | 19.8 | 42.0 | 99.0 | 2.9 | 44.9 | 4.0 |
| I12302 | Robust | 15 | 20.5 | 20.1 | 52.0 | 103.0 | 5.0 | 34.7 | 2.7 |
| BC128 | Ensign | 10 | 18.6 | 19.2 | 43.0 | 102.0 | 3.0 | 46.7 | 3.3 |
| BC055 | Sanilac | 1 | 17.7 | 16.3 | 40.0 | 100.0 | 1.9 | 45.9 | 3.7 |
| BC306 | Avalanche | 11 | 17.4 | 23.0 | 41.0 | 105.0 | 2.4 | 48.2 | 4.0 |
| MEAN (16) | | | 22.9 | 19.0 | 43.8 | 102.0 | 2.7 | 47.2 | 3.9 |
| LSD (0.05) | | | 2.8 | 1.2 | 2.6 | 1.9 | 0.4 | 2.1 | 0.5 |
| CV (%) | | | 8.5 | 4.6 | 3.2 | 1.3 | 9.5 | 3.1 | 9.3 |

| EXPERIMENT 2107 STANDARD GREAT NORTHERN YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| G11438 | G07309/P08401 | 8 | 32.1 | 39.8 | 42.0 | 98.0 | 2.5 | 48.0 | 4.3 |
| G08254 | G04514/Matterhorn | 2 | 30.8 | 40.9 | 42.0 | 98.0 | 3.0 | 46.0 | 4.0 |
| G11416 | G05220/X07810 | 18 | 30.1 | 36.5 | 42.0 | 100.0 | 2.5 | 46.0 | 4.3 |
| G11440 | G07309/P08401 | 29 | 28.8 | 34.9 | 44.0 | 99.0 | 2.5 | 47.0 | 4.0 |
| G11464 | G07309//G07302/BMN13 | 7 | 28.7 | 44.6 | 43.0 | 101.0 | 2.0 | 49.5 | 4.3 |
| G11429 | G07309//G05241/B04588 | 14 | 28.6 | 32.1 | 45.0 | 104.0 | 3.0 | 48.5 | 4.0 |
| G11441 | G07309/P08401 | 15 | 28.4 | 38.3 | 42.0 | 99.0 | 2.0 | 48.5 | 3.5 |
| G11427 | G07309//G07302/BMN13 | 12 | 27.7 | 38.1 | 42.0 | 100.0 | 3.0 | 47.5 | 4.0 |
| G08259 | G04517/G02647 | 4 | 27.2 | 40.2 | 43.0 | 98.0 | 3.0 | 47.0 | 3.8 |
| G11411 | G05220/X07810 | 23 | 27.1 | 31.2 | 44.0 | 99.0 | 2.0 | 48.5 | 4.3 |
| G11428 | G07309//G07302/BMN13 | 26 | 26.5 | 37.8 | 42.0 | 99.0 | 2.5 | 49.0 | 3.8 |
| G11452 | G08274/P08410 | 13 | 26.4 | 36.8 | 43.0 | 98.0 | 2.0 | 45.5 | 3.3 |
| G11405 | G05220//G04207/P05437 | 17 | 26.3 | 35.2 | 44.0 | 102.0 | 3.0 | 47.0 | 4.0 |
| G09329 | G04514/G02647 | 3 | 25.9 | 39.9 | 43.0 | 100.0 | 2.5 | 46.5 | 3.8 |
| G11406 | MATTERHORN//G04207/P05437 | 22 | 25.8 | 41.5 | 41.0 | 100.0 | 2.5 | 49.0 | 3.8 |
| G11463 | G07309//G04207/I07130 | 16 | 25.8 | 39.6 | 44.0 | 102.0 | 3.0 | 47.0 | 3.8 |
| G08160 | Matterhorn/E507 | 5 | 25.7 | 31.7 | 44.0 | 99.0 | 2.0 | 47.5 | 3.0 |
| G93414 | **MATTERHORN** | 27 | 25.4 | 38.7 | 43.0 | 99.0 | 3.0 | 46.0 | 4.0 |
| G11431 | G07309//G05241/B04588 | 19 | 25.0 | 34.4 | 45.0 | 102.0 | 2.5 | 49.0 | 4.3 |
| G09303 | G04207/P05437 | 1 | 24.7 | 34.6 | 43.0 | 101.0 | 2.0 | 49.0 | 4.3 |
| G11404 | G05220//G04207/P05437 | 6 | 24.3 | 39.8 | 42.0 | 104.0 | 3.0 | 46.5 | 3.5 |
| G11424 | G07302//G04207/I07130 | 20 | 24.3 | 37.4 | 42.0 | 98.0 | 2.5 | 44.5 | 3.5 |
| G11467 | NE-1-06-19//G04207/BMN13 | 32 | 23.9 | 27.5 | 46.0 | 103.0 | 1.5 | 55.0 | 4.0 |
| G11418 | G05220//G04207/P05437 | 25 | 23.8 | 37.9 | 42.0 | 103.0 | 3.0 | 46.5 | 4.0 |
| G11412 | G05220/X07810 | 34 | 23.6 | 31.7 | 43.0 | 101.0 | 1.5 | 51.0 | 4.0 |
| G11465 | NE-1-06-19//G04207/BMN13 | 31 | 23.4 | 28.8 | 44.0 | 100.0 | 1.5 | 53.0 | 4.5 |
| G11468 | NE-1-06-19//G04207/BMN13 | 36 | 23.4 | 29.8 | 45.0 | 103.0 | 1.5 | 52.0 | 3.8 |
| G11423 | G07302//I07130/G05239 | 28 | 23.0 | 39.0 | 44.0 | 100.0 | 2.5 | 46.5 | 4.0 |
| G11449 | G08274/P08410 | 11 | 22.6 | 32.8 | 43.0 | 103.0 | 1.5 | 49.5 | 4.3 |
| G11459 | G08210/P06125 | 24 | 22.6 | 32.8 | 44.0 | 102.0 | 2.5 | 50.5 | 4.0 |
| G11422 | G07302//I07130/G05239 | 30 | 22.5 | 34.0 | 43.0 | 101.0 | 3.0 | 47.0 | 3.5 |
| G12501 | G07309//G05241/B04588 | 35 | 21.9 | 32.9 | 42.0 | 101.0 | 2.0 | 52.0 | 5.3 |
| G11450 | G08274/P08410 | 9 | 20.1 | 34.9 | 41.0 | 103.0 | 1.0 | 51.0 | 3.5 |
| G11436 | G07302/P07406 | 21 | 19.6 | 35.6 | 43.0 | 103.0 | 3.0 | 49.0 | 3.5 |
| G11433 | G07302/P07406 | 33 | 19.0 | 30.4 | 45.0 | 104.0 | 3.0 | 47.5 | 3.5 |
| G08121 | MATTERHORN/EMP 507 | 10 | 14.0 | 29.3 | 50.0 | 110.0 | 4.0 | 45.0 | 2.3 |
| MEAN (36) | | | 25.0 | 35.6 | 43.0 | 100.8 | 2.4 | 48.3 | 3.9 |
| LSD (0.05) | | | 3.1 | 4.0 | 2.0 | 2.2 | 0.8 | 2.0 | 0.8 |
| CV (%) | | | 10.6 | 9.5 | 2.8 | 1.3 | 19.0 | 2.4 | 17.1 |

| EXPERIMENT 2108 STANDARD PINTO YIELD TRIAL | | | | | | | | | PLANTED: 6/7/12 |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| P07863 | AN-37/P02630, **ELDORADO** | 1 | 35.0 | 40.8 | 45.0 | 105.0 | 2.5 | 48.5 | 4.5 |
| I11255 | PT8-6 | 23 | 33.5 | 38.8 | 45.0 | 98.0 | 3.5 | 46.0 | 3.0 |
| I09123 | Sierra/Buster, **Medicine Hat** | 3 | 32.2 | 43.7 | 43.0 | 96.0 | 2.5 | 42.5 | 3.0 |
| P09425 | P00225/USPT-CBB-6 | 6 | 32.0 | 39.1 | 44.0 | 97.0 | 2.5 | 48.0 | 4.0 |
| P12610 | P08362/P08401 | 33 | 31.9 | 38.3 | 42.0 | 99.0 | 1.0 | 54.5 | 5.5 |
| P12609 | P08362/P08401 | 32 | 31.8 | 36.1 | 44.0 | 99.0 | 1.0 | 53.5 | 5.0 |
| P11506 | P06121/P05436 | 16 | 31.6 | 36.7 | 44.0 | 98.0 | 2.0 | 52.0 | 4.0 |
| P12603 | P07406/P08401 | 26 | 31.5 | 37.7 | 47.0 | 102.0 | 1.5 | 54.0 | 5.3 |
| I07113 | PNE-6-94-75/Kodiak, **LAPAZ** | 2 | 31.3 | 38.8 | 46.0 | 97.0 | 2.0 | 48.5 | 4.0 |
| P08161 | MATTERHORN/EMP 507 | 10 | 30.8 | 35.4 | 45.0 | 102.0 | 2.5 | 48.0 | 3.8 |
| P12604 | P07406/P08401 | 27 | 30.6 | 38.8 | 45.0 | 99.0 | 2.0 | 54.0 | 5.3 |
| P08162 | MATTERHORN/EMP 507 | 11 | 30.5 | 32.3 | 44.0 | 99.0 | 3.0 | 45.0 | 3.5 |
| P11518 | SANTA FE/P07806 | 9 | 30.0 | 38.2 | 50.0 | 102.0 | 3.0 | 48.5 | 4.8 |
| I06249 | ND020069, **LARIAT** | 5 | 29.9 | 41.7 | 46.0 | 102.0 | 3.5 | 45.0 | 3.0 |
| P08403 | P05463/USPT-CBB-5 | 4 | 29.7 | 33.3 | 44.0 | 97.0 | 2.0 | 48.5 | 4.5 |
| P11519 | SANTA FE/P07806 | 15 | 29.6 | 40.2 | 46.0 | 102.0 | 2.5 | 48.5 | 5.3 |
| P11517 | P06131//P06137 / P05436 | 17 | 29.6 | 42.2 | 45.0 | 98.0 | 2.0 | 46.5 | 3.8 |
| P12612 | P08381/P08401 | 35 | 29.2 | 33.2 | 45.0 | 99.0 | 2.0 | 49.0 | 4.3 |
| P12611 | P08362/P08401 | 34 | 29.0 | 34.5 | 44.0 | 99.0 | 1.0 | 53.0 | 4.5 |
| P11526 | SANTA FE/P07806 | 18 | 28.8 | 37.1 | 43.0 | 99.0 | 2.0 | 46.0 | 3.8 |
| P12613 | P08381/P08401 | 36 | 28.8 | 35.0 | 45.0 | 98.0 | 2.0 | 50.5 | 4.5 |
| P12607 | P07406/P08401 | 30 | 28.6 | 38.3 | 44.0 | 98.0 | 2.0 | 47.5 | 4.0 |
| P12606 | P07406/P08401 | 29 | 28.3 | 36.5 | 46.0 | 99.0 | 2.0 | 53.5 | 4.3 |
| P11523 | P04203/P06125 | 20 | 28.3 | 37.0 | 43.0 | 98.0 | 2.0 | 50.0 | 4.0 |
| P11525 | I06228/P04203 | 14 | 28.1 | 36.0 | 49.0 | 99.0 | 3.0 | 45.0 | 3.3 |
| P12605 | P07406/P08401 | 28 | 27.9 | 35.8 | 47.0 | 101.0 | 2.0 | 52.5 | 4.5 |
| P12608 | P08327/P08401 | 31 | 27.1 | 31.8 | 45.0 | 100.0 | 2.0 | 50.5 | 4.5 |
| P12601 | P07405//I06228/P07405 | 24 | 24.3 | 37.2 | 46.0 | 102.0 | 2.0 | 52.0 | 3.8 |
| P11522 | P04203/P06125 | 12 | 24.2 | 34.9 | 43.0 | 99.0 | 2.0 | 49.0 | 3.8 |
| P11511 | G08215/I06228 | 21 | 23.8 | 34.0 | 46.0 | 104.0 | 3.0 | 48.0 | 3.8 |
| P11456 | G07302/SANTA FE | 13 | 23.8 | 33.3 | 44.0 | 103.0 | 3.5 | 42.5 | 3.0 |
| P11507 | P04203/AZTEC | 19 | 22.0 | 34.0 | 44.0 | 102.0 | 2.5 | 47.5 | 3.8 |
| P12602 | P07405//I06228/P07405 | 25 | 21.7 | 38.1 | 44.0 | 101.0 | 2.0 | 51.5 | 3.3 |
| P11509 | G08215/P07406 | 22 | 21.5 | 40.9 | 45.0 | 103.0 | 2.5 | 49.0 | 3.3 |
| I08933 | 37-2, USPT-WM-12 | 7 | 19.3 | 32.9 | 45.0 | 105.0 | 3.5 | 44.0 | 2.8 |
| P04205 | P99119/G99750, **SANTA FE** | 8 | 16.2 | 36.1 | 44.0 | 103.0 | 3.5 | 42.5 | 3.0 |
| MEAN (36) | | | 28.1 | 36.9 | 44.7 | 99.9 | 2.3 | 48.8 | 4.0 |
| LSD (0.05) | | | 3.1 | 2.7 | 1.5 | 2.7 | 0.5 | 0.5 | 0.6 |
| CV (%) | | | 9.5 | 6.2 | 2.0 | 1.6 | 13.4 | 0.6 | 13.0 |

| EXPERIMENT 2109 STANDARD RED AND PINK YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| S11703 | R06418/S07809 | 19 | 31.4 | 32.3 | 40.0 | 98.0 | 3.5 | 44.5 | 3.0 |
| S08418 | S02754/S04503, **ROSETTA** | 2 | 31.3 | 31.1 | 43.0 | 98.0 | 1.5 | 50.5 | 5.5 |
| R11608 | NOT ON FILE | 14 | 31.3 | 33.9 | 44.0 | 102.0 | 2.0 | 52.5 | 4.0 |
| R11633 | R06412//P06121/P05436 | 9 | 31.2 | 33.8 | 44.0 | 100.0 | 3.0 | 46.5 | 4.0 |
| R11616 | R08504/SER26 | 17 | 29.8 | 34.2 | 42.0 | 102.0 | 2.5 | 46.5 | 4.0 |
| R11614 | R08504/SER26 | 15 | 29.5 | 35.9 | 44.0 | 101.0 | 2.5 | 49.0 | 4.5 |
| R11615 | R08504/SER26 | 10 | 29.4 | 34.0 | 45.0 | 102.0 | 2.0 | 50.0 | 4.0 |
| R11604 | R02189//R06414/RAB651 | 18 | 28.8 | 33.3 | 43.0 | 102.0 | 2.0 | 49.0 | 4.5 |
| S07501 | Sedona/ABCP #15//R02205 | 1 | 28.5 | 35.2 | 48.0 | 104.0 | 3.0 | 47.0 | 4.0 |
| S11701 | S04504/R06420 | 12 | 27.8 | 30.6 | 40.0 | 99.0 | 2.5 | 45.5 | 3.0 |
| S11610 | R06412//S07501/R06422 | 13 | 27.8 | 31.1 | 43.0 | 99.0 | 4.0 | 44.5 | 3.5 |
| R11630 | R08504/SER 21 | 26 | 27.7 | 28.8 | 41.0 | 98.0 | 2.0 | 50.5 | 5.0 |
| S11631 | R06412/X08702 | 21 | 27.4 | 28.1 | 43.0 | 99.0 | 3.0 | 45.5 | 4.0 |
| S00809 | R94142/X94076, **SEDONA** | 3 | 27.4 | 38.0 | 46.0 | 100.0 | 3.0 | 45.5 | 3.5 |
| R11618 | R08504/SER26 | 27 | 27.2 | 32.9 | 42.0 | 99.0 | 2.0 | 46.5 | 3.5 |
| I11227 | PK10-8 | 29 | 26.5 | 29.8 | 41.0 | 98.0 | 4.0 | 45.0 | 3.0 |
| I10126 | PS02-050-2 | 6 | 26.3 | 31.2 | 40.0 | 101.0 | 2.0 | 48.0 | 4.0 |
| R11629 | R08504/AMADEUS 77 | 22 | 26.2 | 34.4 | 41.0 | 101.0 | 1.5 | 55.0 | 4.0 |
| R11611 | R06412//S07501/R06422 | 20 | 26.0 | 33.5 | 43.0 | 101.0 | 4.0 | 41.5 | 3.0 |
| R11610 | R06412//S07501/R06422 | 8 | 25.9 | 31.6 | 45.0 | 101.0 | 4.0 | 41.5 | 3.0 |
| S11707 | S04505//PK 7-5/R06420 | 11 | 25.4 | 36.6 | 42.0 | 102.0 | 3.0 | 46.0 | 3.5 |
| R11627 | R06427/RAB655//R06420 | 24 | 24.9 | 31.0 | 41.0 | 99.0 | 3.0 | 44.0 | 3.0 |
| R11617 | R08504/SER26 | 25 | 23.9 | 33.9 | 43.0 | 102.0 | 2.5 | 48.0 | 4.0 |
| R09506 | R06249/Merlot | 7 | 23.9 | 34.4 | 42.0 | 103.0 | 2.0 | 52.5 | 3.0 |
| I11231 | PK10-24 | 30 | 23.8 | 36.5 | 41.0 | 104.0 | 4.0 | 46.0 | 3.0 |
| R11607 | S06410/R06422 | 16 | 22.9 | 34.3 | 43.0 | 101.0 | 2.5 | 47.0 | 3.5 |
| I09208 | NDZ06249, RIO ROJO | 4 | 22.4 | 27.9 | 40.0 | 103.0 | 2.5 | 47.0 | 3.0 |
| R98026 | R94037/R94161, **MERLOT** | 5 | 22.2 | 36.8 | 48.0 | 105.0 | 3.0 | 48.5 | 3.5 |
| S11706 | S04505//TARS SR05/R02002 | 28 | 22.0 | 21.9 | 40.0 | 100.0 | 2.0 | 49.0 | 3.5 |
| R11632 | S08406/S07809 | 23 | 21.6 | 32.2 | 43.0 | 99.0 | 2.0 | 47.5 | 4.0 |
| MEAN (30) | | | 26.7 | 32.6 | 42.6 | 100.6 | 2.7 | 47.3 | 3.7 |
| LSD (0.05) | | | 3.2 | 2.2 | 1.9 | 1.4 | 0.6 | 2.6 | 0.8 |
| CV (%) | | | 10.2 | 5.7 | 2.6 | 0.8 | 12.9 | 3.2 | 12.7 |

| EXPERIMENT 2110 STANDARD FLOR DE MAYO YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| R11801FJ | X07712 / X07721 | 8 | 33.6 | 35.3 | 38.0 | 100.0 | 3.0 | 48.3 | 5.3 |
| R11802FJ | X07712 / X07721 | 7 | 30.2 | 36.2 | 41.0 | 103.0 | 3.0 | 49.0 | 5.0 |
| R11806FM | X07714 / X07710 | 4 | 30.0 | 28.1 | 49.0 | 106.0 | 4.0 | 46.3 | 5.0 |
| R11808FM | X07714 / X07710 | 3 | 27.3 | 26.4 | 49.0 | 105.0 | 3.7 | 47.0 | 5.0 |
| R11807FM | X07714 / X07710 | 13 | 26.2 | 28.1 | 49.0 | 105.0 | 4.0 | 46.3 | 5.0 |
| R11803FJ | X07712 / X07721 | 2 | 25.7 | 33.6 | 41.0 | 100.0 | 3.0 | 49.0 | 4.7 |
| R11812FM | X07714 / X07710 | 15 | 25.6 | 27.4 | 49.0 | 108.0 | 4.0 | 44.0 | 3.7 |
| R11817FJ | X07717 / X07710 | 1 | 24.9 | 33.4 | 45.0 | 103.0 | 4.3 | 41.7 | 3.3 |
| R11811FM | X07714 / X07710 | 10 | 24.9 | 30.5 | 49.0 | 107.0 | 4.0 | 45.7 | 4.3 |
| R11815FM | X07717 / X07710 | 14 | 24.3 | 27.4 | 48.0 | 106.0 | 4.0 | 45.3 | 4.3 |
| R11804FM | X07714 / X07710 | 5 | 23.3 | 26.2 | 49.0 | 106.0 | 3.7 | 47.0 | 4.3 |
| R11805FM | X07714 / X07710 | 9 | 23.0 | 28.3 | 50.0 | 107.0 | 4.3 | 45.3 | 3.7 |
| R11809FM | X07714 / X07710 | 6 | 21.7 | 27.4 | 46.0 | 106.0 | 3.3 | 47.3 | 4.3 |
| R11810FM | X07714 / X07710 | 12 | 21.4 | 25.6 | 49.0 | 107.0 | 3.7 | 47.0 | 4.0 |
| I11215FM | **FM EUGENIA** | 16 | 20.9 | 30.4 | 46.0 | 109.0 | 4.7 | 41.3 | 3.0 |
| R11814FM | X07714 / X07710 | 11 | 18.3 | 29.1 | 49.0 | 109.0 | 3.7 | 45.3 | 3.3 |
| MEAN (16) | | | 25.1 | 29.6 | 46.6 | 105.5 | 3.8 | 46.0 | 4.3 |
| LSD (0.05) | | | 5.4 | 2.1 | 2.4 | 2.1 | 0.5 | 2.1 | 0.7 |
| CV (%) | | | 15.3 | 5.0 | 2.8 | 1.4 | 10.3 | 3.3 | 12.2 |

| EXPERIMENT 2111 PRELIMINARY GREAT NORTHERN YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| G12502 | P08410/G07302 | 1 | 31.5 | 34.7 | 42.0 | 98.0 | 1.7 | 48.7 | 4.7 |
| G12503 | P08410/G07302 | 2 | 30.6 | 32.7 | 43.0 | 98.0 | 2.0 | 48.3 | 4.7 |
| G12504 | P08410/G07302 | 3 | 29.3 | 34.1 | 43.0 | 99.0 | 1.7 | 49.0 | 4.0 |
| G12508 | P08410/G08275 | 7 | 28.5 | 34.3 | 43.0 | 100.0 | 2.0 | 53.3 | 5.7 |
| G93414 | **MATTERHORN** | 15 | 27.2 | 32.1 | 41.0 | 100.0 | 3.0 | 47.0 | 3.7 |
| G12903 | G07321/FUJI | 11 | 25.8 | 23.1 | 41.0 | 103.0 | 2.3 | 48.7 | 4.3 |
| G12901 | G07321/FUJI | 9 | 25.5 | 25.4 | 44.0 | 103.0 | 2.0 | 52.0 | 4.7 |
| G12902 | G07321/FUJI | 10 | 25.4 | 21.5 | 40.0 | 101.0 | 2.3 | 48.3 | 4.3 |
| G12507 | P08410/G08275 | 6 | 25.2 | 31.7 | 42.0 | 102.0 | 1.7 | 53.3 | 5.0 |
| G12509 | P08410/G08275 | 8 | 23.9 | 32.7 | 42.0 | 100.0 | 1.7 | 52.3 | 5.0 |
| G12904 | G07321/ FUJI | 12 | 23.5 | 24.0 | 41.0 | 104.0 | 2.0 | 51.3 | 4.0 |
| G12506 | P08410/G08275 | 5 | 20.8 | 23.7 | 43.0 | 105.0 | 2.0 | 49.7 | 4.0 |
| G12905 | G07321/FUJI | 13 | 19.4 | 24.2 | 43.0 | 106.0 | 2.3 | 50.3 | 3.3 |
| G05922 | HIME TEBO*4/MATTERHORN,**FUJI** | 16 | 18.5 | 26.3 | 42.0 | 105.0 | 2.7 | 45.7 | 3.7 |
| G12505 | P08410/G08275 | 4 | 18.2 | 31.9 | 41.0 | 103.0 | 2.3 | 50.0 | 4.0 |
| G12906 | G07321/FUJI | 14 | 16.0 | 30.7 | 41.0 | 105.0 | 2.3 | 49.3 | 3.7 |
| MEAN (16) | | | 24.3 | 28.9 | 42.1 | 102.0 | 2.1 | 49.8 | 4.3 |
| LSD (0.05) | | | 3.5 | 2.8 | 1.8 | 1.9 | 0.4 | 2.1 | 0.4 |
| CV (%) | | | 10.3 | 6.9 | 2.3 | 1.3 | 14.5 | 3.0 | 5.9 |

| EXPERIMENT 2112 PRELIMINARY RED AND PINK YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| S12910 | PK9-7/Rosetta | 84 | 36.7 | 36.7 | 42.0 | 97.0 | 3.0 | 45.7 | 3.7 |
| R12859 | R08512/SR9-5 | 59 | 36.6 | 35.3 | 43.0 | 98.0 | 1.3 | 55.7 | 5.7 |
| S12905 | Rosetta/NDZ06209 | 79 | 36.1 | 33.8 | 44.0 | 97.0 | 1.7 | 52.0 | 5.0 |
| S08418 | S02754/S04503, **ROSETTA** | 89 | 36.0 | 37.4 | 42.0 | 98.0 | 2.0 | 52.7 | 5.3 |
| R12832 | SR9-5/Merlot | 32 | 35.8 | 37.3 | 44.0 | 100.0 | 2.0 | 50.3 | 3.3 |
| S12911 | PK9-7/Rosetta | 85 | 35.2 | 36.5 | 43.0 | 97.0 | 2.7 | 48.0 | 4.0 |
| R12860 | R08512/SR9-5 | 60 | 35.2 | 37.3 | 41.0 | 98.0 | 1.7 | 51.7 | 4.3 |
| R12853 | NDZ06209/R08516 | 53 | 34.8 | 37.4 | 45.0 | 96.0 | 3.0 | 46.7 | 3.7 |
| R12804 | Merlot/NDZ06209 | 4 | 34.6 | 37.2 | 43.0 | 99.0 | 2.0 | 53.0 | 4.7 |
| S12903 | Rosetta/PK9-4 | 77 | 34.5 | 28.4 | 44.0 | 97.0 | 1.7 | 50.3 | 5.3 |
| R12824 | R09505/NDZ06209 | 24 | 34.4 | 36.7 | 43.0 | 96.0 | 1.3 | 49.7 | 5.7 |
| S12904 | Rosetta/PK9-4 | 78 | 34.2 | 33.5 | 43.0 | 97.0 | 2.0 | 52.0 | 6.0 |
| R12873 | Rosetta/NDZ06209 | 73 | 34.1 | 31.8 | 44.0 | 99.0 | 2.3 | 49.7 | 5.3 |
| R12801 | R08515//R06420/SER 26 | 1 | 33.8 | 39.0 | 44.0 | 100.0 | 2.3 | 49.7 | 4.0 |
| S12909 | PK9-7/Rosetta | 83 | 33.6 | 35.4 | 44.0 | 98.0 | 2.7 | 47.0 | 3.7 |
| R12855 | R08512/SR9-5 | 55 | 33.4 | 34.2 | 44.0 | 99.0 | 2.0 | 54.0 | 5.3 |
| S12906 | Rosetta/NDZ06209 | 80 | 33.1 | 35.6 | 42.0 | 96.0 | 2.7 | 48.7 | 4.3 |
| R12849 | NDZ06209/R08516 | 49 | 32.9 | 31.8 | 50.0 | 99.0 | 3.3 | 48.3 | 4.0 |
| R12813 | R06415/NDZ06209 | 13 | 32.7 | 31.2 | 43.0 | 99.0 | 2.3 | 47.3 | 4.0 |
| R12857 | R08512/SR9-5 | 57 | 32.7 | 36.3 | 43.0 | 97.0 | 1.0 | 54.7 | 5.0 |
| R12864 | R02085/SR9-2 | 64 | 32.3 | 34.7 | 43.0 | 96.0 | 1.3 | 53.7 | 4.7 |
| R12833 | SR9-5/Merlot | 33 | 32.3 | 36.1 | 43.0 | 96.0 | 1.3 | 54.7 | 4.3 |
| R12850 | NDZ06209/R08516 | 50 | 32.1 | 33.2 | 49.0 | 102.0 | 2.3 | 55.0 | 4.3 |
| R12874 | Rosetta/NDZ06209 | 74 | 32.1 | 30.4 | 44.0 | 95.0 | 2.0 | 50.0 | 4.7 |
| R12851 | NDZ06209/R08516 | 51 | 31.9 | 29.6 | 44.0 | 97.0 | 2.7 | 48.7 | 5.0 |
| R12846 | NDZ06209/Merlot | 46 | 31.7 | 31.6 | 48.0 | 98.0 | 3.0 | 46.7 | 3.7 |
| R12845 | SR9-5/R09508 | 45 | 31.7 | 32.6 | 48.0 | 102.0 | 1.7 | 56.3 | 4.3 |
| R12814 | R06415/NDZ06209 | 14 | 31.5 | 34.2 | 44.0 | 99.0 | 2.7 | 47.3 | 4.0 |
| R12852 | NDZ06209/R08516 | 52 | 31.4 | 32.0 | 43.0 | 98.0 | 2.0 | 51.7 | 5.0 |
| R12858 | R08512/SR9-5 | 58 | 31.4 | 34.1 | 42.0 | 100.0 | 1.7 | 53.7 | 5.0 |
| S12908 | PK9-4/S08410 | 82 | 31.3 | 36.1 | 44.0 | 98.0 | 2.3 | 49.3 | 4.7 |
| R12843 | SR9-5/R09508 | 43 | 31.0 | 34.0 | 50.0 | 99.0 | 2.3 | 53.3 | 4.7 |
| R12866 | R02085/SR9-2 | 66 | 31.0 | 35.3 | 43.0 | 96.0 | 2.7 | 48.7 | 4.0 |
| R12844 | SR9-5/R09508 | 44 | 30.9 | 35.4 | 47.0 | 100.0 | 1.3 | 56.0 | 4.7 |
| R12828 | R09505/NDZ06209 | 28 | 30.5 | 37.1 | 42.0 | 98.0 | 1.7 | 53.3 | 5.7 |
| R12805 | Merlot/NDZ06209 | 5 | 30.5 | 28.8 | 47.0 | 98.0 | 2.3 | 55.7 | 4.0 |
| R12812 | R06415/NDZ06209 | 12 | 30.4 | 37.6 | 44.0 | 101.0 | 3.3 | 44.7 | 3.7 |
| R12802 | Merlot/SR9-2 | 2 | 30.4 | 34.8 | 46.0 | 101.0 | 2.7 | 52.0 | 4.0 |
| R12818 | R08504/NDZ06249 | 18 | 30.3 | 32.6 | 45.0 | 98.0 | 1.7 | 52.3 | 5.3 |
| R12840 | SR9-5/R02072 | 40 | 30.2 | 32.3 | 43.0 | 100.0 | 1.7 | 55.0 | 4.3 |

| EXPERIMENT 2112 PRELIMINARY RED AND PINK YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| R12807 | Merlot/NDZ06209 | 7 | 29.9 | 36.3 | 44.0 | 96.0 | 2.3 | 47.7 | 4.3 |
| R12820 | R08504/NDZ06249 | 20 | 29.6 | 34.3 | 42.0 | 99.0 | 2.0 | 52.3 | 5.3 |
| S12907 | PK9-4/S08410 | 81 | 29.5 | 39.5 | 45.0 | 97.0 | 2.7 | 46.7 | 3.7 |
| R12856 | R08512/SR9-5 | 56 | 29.3 | 36.3 | 42.0 | 99.0 | 2.0 | 53.3 | 4.0 |
| R12823 | R08515/NDZ06249 | 23 | 29.1 | 33.1 | 42.0 | 101.0 | 2.7 | 50.0 | 5.3 |
| R12842 | SR9-5/R09508 | 42 | 29.0 | 26.4 | 50.0 | 101.0 | 2.0 | 57.0 | 4.7 |
| R12819 | R08504/NDZ06249 | 19 | 29.0 | 34.2 | 45.0 | 96.0 | 2.0 | 49.0 | 4.0 |
| R12872 | R02082/SR9-2 | 72 | 28.8 | 34.0 | 43.0 | 102.0 | 3.3 | 46.3 | 3.0 |
| S12902 | S08410//S07809/SER 26 | 76 | 28.8 | 33.5 | 49.0 | 102.0 | 3.0 | 48.7 | 3.3 |
| R12841 | SR9-5/R09508 | 41 | 28.8 | 28.4 | 49.0 | 98.0 | 2.3 | 52.0 | 5.7 |
| R12826 | R09505/NDZ06209 | 26 | 28.8 | 36.5 | 42.0 | 100.0 | 2.0 | 49.0 | 4.3 |
| S00809 | R94142/X94076, **SEDONA** | 88 | 28.7 | 39.1 | 47.0 | 98.0 | 3.0 | 48.3 | 4.0 |
| R12861 | R02085/SR9-2 | 61 | 28.7 | 32.8 | 42.0 | 96.0 | 1.3 | 50.7 | 4.0 |
| S12901 | SR9-5/R02072 | 75 | 28.5 | 33.2 | 43.0 | 97.0 | 1.0 | 54.3 | 4.7 |
| R12806 | Merlot/NDZ06209 | 6 | 28.3 | 38.3 | 42.0 | 97.0 | 1.7 | 47.7 | 4.3 |
| R12862 | R02085/SR9-2 | 62 | 28.1 | 37.5 | 44.0 | 97.0 | 1.7 | 50.0 | 4.0 |
| R12827 | R09505/NDZ06209 | 27 | 28.0 | 36.1 | 41.0 | 98.0 | 2.0 | 49.3 | 4.7 |
| R12835 | SR9-5/Merlot | 35 | 27.9 | 31.8 | 49.0 | 102.0 | 1.7 | 55.3 | 3.3 |
| R12810 | R06415/R09508 | 10 | 27.9 | 26.0 | 45.0 | 98.0 | 2.0 | 52.3 | 4.7 |
| R12822 | R08512/R09508 | 22 | 27.7 | 32.9 | 43.0 | 97.0 | 2.0 | 52.0 | 4.3 |
| R12867 | NDZ06209/R06413 | 67 | 27.7 | 30.6 | 43.0 | 97.0 | 1.7 | 48.7 | 4.0 |
| R12825 | R09505/NDZ06209 | 25 | 27.6 | 35.5 | 41.0 | 98.0 | 2.3 | 48.0 | 4.7 |
| R12829 | R09505/NDZ06209 | 29 | 27.5 | 34.9 | 41.0 | 96.0 | 1.7 | 49.7 | 5.0 |
| R12863 | R02085/SR9-2 | 63 | 27.5 | 37.0 | 44.0 | 96.0 | 1.7 | 51.7 | 4.0 |
| R12815 | R08504/NDZ06249 | 15 | 27.4 | 36.4 | 42.0 | 67.0 | 2.0 | 53.7 | 5.0 |
| R12803 | Merlot/NDZ06209 | 3 | 27.3 | 32.4 | 45.0 | 99.0 | 1.7 | 51.7 | 4.3 |
| I10126 | PS02-050-2 | 87 | 27.1 | 31.0 | 42.0 | 99.0 | 2.0 | 51.7 | 5.0 |
| R12811 | R06415/NDZ06209 | 11 | 27.0 | 31.2 | 43.0 | 96.0 | 2.0 | 45.7 | 3.7 |
| R12838 | SR9-5/R02072 | 38 | 26.5 | 33.2 | 45.0 | 103.0 | 1.7 | 56.0 | 3.7 |
| R12848 | NDZ06209/Merlot | 48 | 26.5 | 36.6 | 50.0 | 100.0 | 3.0 | 47.7 | 3.3 |
| R12831 | SR9-2/R08516 | 31 | 26.4 | 35.5 | 42.0 | 96.0 | 3.0 | 48.3 | 3.3 |
| R12868 | NDZ06209/R06413 | 68 | 26.2 | 32.5 | 45.0 | 100.0 | 2.7 | 46.0 | 3.3 |
| R12834 | SR9-5/Merlot | 34 | 26.1 | 38.9 | 49.0 | 103.0 | 2.0 | 53.0 | 3.7 |
| R98026 | R94037/R94161, **MERLOT** | 86 | 25.9 | 37.5 | 48.0 | 103.0 | 3.0 | 49.3 | 3.7 |
| R12847 | NDZ06209/Merlot | 47 | 25.8 | 34.7 | 49.0 | 102.0 | 3.7 | 46.0 | 3.0 |
| R12816 | R08504/NDZ06249 | 16 | 25.3 | 32.4 | 43.0 | 101.0 | 2.0 | 54.0 | 4.0 |
| R12821 | R08512/R09508 | 21 | 25.3 | 29.7 | 45.0 | 95.0 | 2.3 | 48.0 | 4.3 |
| R12871 | NDZ06249/R08516 | 71 | 25.2 | 30.1 | 50.0 | 101.0 | 2.7 | 52.3 | 4.3 |
| R12854 | NDZ06249/Merlot | 54 | 25.0 | 30.4 | 51.0 | 103.0 | 1.7 | 56.0 | 4.0 |
| R12809 | R06415/R09508 | 9 | 23.9 | 24.9 | 46.0 | 96.0 | 2.0 | 53.3 | 4.3 |

| EXPERIMENT 2112 PRELIMINARY RED AND PINK YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** |
| R12817 | R08504/NDZ06249 | 17 | 23.9 | 37.1 | 42.0 | 101.0 | 2.0 | 51.7 | 4.3 |
| R12865 | R02085/SR9-2 | 65 | 23.7 | 30.8 | 46.0 | 102.0 | 2.7 | 52.7 | 3.7 |
| R12808 | R06415/R09508 | 8 | 23.3 | 27.1 | 45.0 | 98.0 | 2.0 | 50.7 | 4.3 |
| R12830 | R09508/Merlot | 30 | 23.0 | 32.9 | 53.0 | 104.0 | 2.7 | 47.3 | 2.7 |
| R12836 | SR9-5/Merlot | 36 | 22.9 | 33.1 | 50.0 | 106.0 | 2.7 | 51.7 | 2.7 |
| R12837 | SR9-5/Merlot | 37 | 22.2 | 37.2 | 50.0 | 105.0 | 2.0 | 53.7 | 3.7 |
| I12308 | **Rojo Seda** | 90 | 17.4 | 25.2 | 46.0 | 102.0 | 3.0 | 47.0 | 3.3 |
| R12839 | SR9-5/R02072 | 39 | 16.8 | 34.1 | 46.0 | 105.0 | 1.3 | 56.3 | 3.0 |
| R12870 | NDZ06249/R09508 | 70 | 15.2 | 31.4 | 47.0 | 104.0 | 1.7 | 53.3 | 3.3 |
| R12869 | NDZ06249/R09508 | 69 | 10.3 | 30.2 | 46.0 | 101.0 | 1.3 | 54.7 | 4.0 |
| MEAN (90) | | | 29.1 | 33.8 | 44.6 | 98.7 | 2.2 | 51.0 | 4.3 |
| LSD (0.05) | | | 4.1 | 2.5 | 0.7 | 8.6 | 0.5 | 2.3 | 0.8 |
| CV (%) | | | 10.5 | 5.4 | 1.0 | 6.5 | 17.4 | 3.4 | 13.3 |

| EXPERIMENT 2113 PINTO GENETIC GAIN YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| BC168 | UI-196 | 12 | 35.7 | 38.0 | 44.0 | 98.0 | 4.7 | 43.7 | 3.0 |
| BC300 | Lariat | 19 | 31.9 | 43.0 | 44.0 | 102.0 | 3.0 | 48.3 | 4.0 |
| BC301 | Stampede | 18 | 31.7 | 41.9 | 43.0 | 99.0 | 2.0 | 52.0 | 5.0 |
| BC016 | Bill Z | 8 | 31.3 | 37.1 | 41.0 | 95.0 | 5.0 | 41.3 | 3.0 |
| BC177 | UI-111 | 1 | 31.1 | 40.0 | 44.0 | 94.0 | 4.3 | 42.3 | 3.0 |
| BC120 | La Paz | 20 | 31.0 | 36.4 | 46.0 | 101.0 | 2.0 | 52.7 | 5.0 |
| BC021 | Olathe | 5 | 29.3 | 40.2 | 42.0 | 94.0 | 5.0 | 42.0 | 3.0 |
| BC070 | Sierra | 4 | 29.1 | 35.5 | 50.0 | 103.0 | 3.3 | 47.0 | 4.0 |
| BC167 | UI-126 | 9 | 29.0 | 39.1 | 43.0 | 96.0 | 4.3 | 43.0 | 3.0 |
| BC231 | Othello | 13 | 27.9 | 41.2 | 40.0 | 94.0 | 4.3 | 43.7 | 3.0 |
| BC020 | Montrose | 15 | 27.2 | 37.8 | 44.0 | 98.0 | 5.0 | 41.0 | 3.0 |
| BC299 | Maverick | 14 | 26.5 | 35.2 | 42.0 | 95.0 | 3.7 | 44.7 | 3.0 |
| BC161 | Common Pinto | 3 | 26.2 | 36.6 | 43.0 | 93.0 | 5.0 | 41.0 | 3.0 |
| BC178 | UI-114 | 2 | 24.7 | 35.0 | 41.0 | 94.0 | 4.7 | 41.7 | 3.0 |
| BC196 | Chase | 11 | 24.7 | 37.9 | 43.0 | 97.0 | 4.0 | 43.3 | 3.0 |
| BC228 | Nodak | 10 | 23.9 | 34.9 | 40.0 | 94.0 | 4.3 | 41.3 | 3.0 |
| BC115 | Remington | 7 | 23.0 | 33.1 | 41.0 | 96.0 | 3.0 | 47.7 | 3.7 |
| BC110 | Topaz | 6 | 21.2 | 35.9 | 41.0 | 94.0 | 4.3 | 43.3 | 3.0 |
| BC024 | Croissant | 17 | 20.5 | 31.3 | 44.0 | 104.0 | 3.0 | 48.3 | 4.0 |
| BC386 | Buster | 16 | 13.7 | 30.0 | 42.0 | 103.0 | 3.3 | 47.7 | 4.0 |
| MEAN (20) | | | 27.0 | 37.0 | 42.7 | 97.3 | 3.9 | 44.8 | 3.4 |
| LSD (0.05) | | | 3.6 | 2.8 | 1.6 | 2.2 | 0.6 | 1.7 | 0.2 |
| CV (%) | | | 9.7 | 5.5 | 2.1 | 1.6 | 10.2 | 2.7 | 3.8 |

| EXPERIMENT 2114 MRPN/CDBN YIELD TRIAL | | | | | | | | PLANTED: 6/7/12 | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| P07863 | AN-37/P02630, **ELDORADO** | 31 | 36.0 | 39.6 | 48.0 | 103.0 | 3.0 | 49.3 | 4.0 |
| P08161 | MATTERHORN/EMP 507 | 32 | 33.9 | 35.3 | 48.0 | 101.0 | 2.5 | 51.4 | 4.0 |
| I11257 | PT9-6 | 3 | 30.2 | 38.7 | 47.0 | 97.0 | 2.0 | 49.9 | 4.0 |
| I12310 | CO 90848-11 | 19 | 29.9 | 39.7 | 49.0 | 100.0 | 1.5 | 54.0 | 4.5 |
| S08418 | S02754/S04503, **ROSETTA** | 9 | 29.1 | 33.5 | 48.0 | 96.0 | 2.0 | 53.6 | 6.0 |
| I12315 | CO 91160-11 | 24 | 28.6 | 36.6 | 48.0 | 99.0 | 3.0 | 47.1 | 4.0 |
| I12307 | ISB-24 | 8 | 28.5 | 38.6 | 47.0 | 95.0 | 3.0 | 47.2 | 3.5 |
| I12324 | NE2-11-22 | 40 | 27.9 | 41.5 | 48.0 | 102.0 | 3.5 | 47.7 | 3.5 |
| I09205 | PK9-4 | 10 | 27.7 | 39.1 | 47.0 | 95.0 | 2.5 | 46.7 | 3.0 |
| G11464 | G07309//G07302/BMN13 | 37 | 27.0 | 43.5 | 47.0 | 99.0 | 2.0 | 51.2 | 4.5 |
| I12309 | UCD-9634 | 11 | 26.9 | 29.9 | 50.0 | 101.0 | 3.0 | 47.8 | 3.5 |
| I11260 | ND020351-R (STAMPEDE-R) | 4 | 26.6 | 38.7 | 48.0 | 100.0 | 2.0 | 53.3 | 4.5 |
| P11522 | P04203/P06125 | 33 | 26.3 | 36.8 | 48.0 | 97.0 | 1.0 | 51.7 | 6.0 |
| G09303 | G04207/P05437 | 34 | 26.2 | 31.4 | 47.0 | 101.0 | 2.0 | 51.1 | 4.0 |
| G93414 | **MATTERHORN** | 17 | 26.1 | 34.4 | 48.0 | 97.0 | 2.0 | 47.7 | 4.0 |
| I12314 | CO 91137-03 | 23 | 25.9 | 39.2 | 47.0 | 97.0 | 2.0 | 47.6 | 4.0 |
| I11273 | GN9-1 | 15 | 25.8 | 37.4 | 49.0 | 104.0 | 4.0 | 43.0 | 3.0 |
| I12317 | ND080208 | 26 | 25.8 | 36.9 | 49.0 | 104.0 | 3.0 | 45.6 | 3.0 |
| I12313 | CO 91007-11 | 22 | 25.5 | 35.3 | 50.0 | 101.0 | 4.0 | 46.9 | 3.5 |
| I84002 | NW410//VICTOR/AURORA, **OTHELLO** | 1 | 25.5 | 37.2 | 48.0 | 93.0 | 5.0 | 40.8 | 3.0 |
| G08254 | G04514/Matterhorn | 35 | 25.0 | 34.7 | 48.0 | 98.0 | 2.0 | 51.3 | 4.5 |
| I12323 | NE1-11-20 | 39 | 24.9 | 33.8 | 49.0 | 102.0 | 4.0 | 43.6 | 3.0 |
| I12316 | CO 91212-10 | 25 | 24.8 | 35.3 | 47.0 | 101.0 | 2.0 | 50.6 | 4.5 |
| I12325 | NE2-11-24 | 41 | 24.8 | 46.5 | 47.0 | 101.0 | 3.5 | 46.4 | 3.5 |
| I12322 | NE1-11-19 | 38 | 24.6 | 35.7 | 49.0 | 103.0 | 3.0 | 49.0 | 3.5 |
| I11221 | SR10-20 | 13 | 24.6 | 34.0 | 48.0 | 100.0 | 2.0 | 51.7 | 4.5 |
| I11238 | ND090713 | 30 | 24.3 | 39.4 | 47.0 | 100.0 | 2.0 | 49.9 | 4.0 |
| I12311 | CO 90848-14 | 20 | 23.7 | 38.2 | 47.0 | 95.0 | 2.0 | 48.9 | 4.0 |
| I12312 | CO 91003-13 | 21 | 23.6 | 35.1 | 50.0 | 101.0 | 3.0 | 46.4 | 3.5 |
| I98313 | CO51715, **MONTROSE** | 18 | 23.3 | 37.0 | 48.0 | 97.0 | 5.0 | 39.8 | 2.5 |
| I09109 | CO55646, **LONG'S PEAK** | 2 | 23.3 | 37.2 | 49.0 | 101.0 | 2.0 | 54.7 | 5.5 |
| G11404 | G05220//G04207/P05437 | 36 | 23.2 | 34.4 | 48.0 | 102.0 | 2.5 | 49.2 | 3.5 |
| I10112 | ND080213 | 27 | 22.8 | 40.1 | 47.0 | 96.0 | 3.0 | 47.2 | 3.5 |
| I12306 | ISB-18 | 7 | 22.7 | 36.6 | 48.0 | 102.0 | 3.5 | 43.2 | 2.5 |
| I09208 | NDZ06249, **RIO ROJO** | 12 | 22.6 | 29.6 | 47.0 | 98.0 | 2.0 | 47.2 | 4.0 |
| I10113 | ND080412 | 29 | 22.3 | 32.1 | 48.0 | 102.0 | 3.0 | 47.8 | 3.5 |
| I12305 | ISB-16 | 6 | 21.6 | 37.4 | 47.0 | 94.0 | 2.5 | 45.8 | 3.0 |
| I12304 | ISB-11 | 5 | 21.3 | 32.9 | 48.0 | 103.0 | 4.0 | 45.4 | 2.5 |
| C06808 | I01800/C03129, **BELLAGIO** | 42 | 20.0 | 55.6 | 48.0 | 101.0 | 3.0 | 46.4 | 4.0 |
| I12318 | NDZ06219 | 28 | 20.0 | 37.3 | 49.0 | 96.0 | 1.0 | 52.0 | 3.5 |
| I07142 | NE-1-06-12, **COYNE** | 14 | 19.6 | 34.5 | 48.0 | 101.0 | 3.0 | 48.4 | 3.5 |
| I99117 | **BUSTER** | 16 | 16.1 | 32.4 | 48.0 | 96.0 | 2.5 | 46.8 | 4.0 |
| MEAN (42) | | 0 | 25.2 | 37.0 | 48.0 | 99.3 | 2.7 | 48.2 | 3.8 |
| LSD (0.05) | | 0 | 3.6 | 3.1 | 1.0 | 2.0 | 0.7 | 2.2 | 0.2 |
| CV (%) | | 0 | 10.6 | 6.1 | 1.2 | 1.2 | 14.6 | 2.7 | 3.6 |

| EXPERIMENT 2115 IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | PLANTED: 6/12/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC234 | PT7-2 | 67 | 34.1 | 40.0 | 44.0 | 100.0 | 3.0 | 48.3 | 3.0 | 2.8 | 50.9 |
| BC286 | A285 | 78 | 32.7 | 20.8 | 45.0 | 102.0 | 4.0 | 41.7 | 3.0 | 4.3 | 39.1 |
| BC387 | Medicine Hat | 96 | 32.4 | 42.3 | 41.0 | 95.0 | 2.0 | 46.7 | 3.7 | 2.8 | 49.2 |
| BC120 | La Paz | 34 | 32.0 | 36.5 | 45.0 | 97.0 | 2.0 | 58.3 | 4.0 | 3.7 | 40.1 |
| BC386 | Buster | 95 | 31.5 | 37.4 | 44.0 | 95.0 | 3.0 | 43.3 | 3.0 | 3.1 | 45.4 |
| BC028 | PR 0340-3-3-1 | 79 | 31.0 | 28.3 | 45.0 | 98.0 | 2.7 | 55.0 | 4.0 | 3.2 | 43.4 |
| BC300 | Lariat | 86 | 31.0 | 40.8 | 44.0 | 100.0 | 3.0 | 51.7 | 4.3 | 3.7 | 37.9 |
| BC093 | Merlot | 28 | 30.9 | 37.5 | 44.0 | 97.0 | 2.7 | 58.3 | 5.3 | 3.8 | 39.9 |
| BC070 | Sierra | 20 | 30.1 | 32.6 | 47.0 | 108.0 | 4.3 | 38.3 | 1.0 | 3.8 | 35.1 |
| BC062 | Domino | 17 | 30.1 | 19.1 | 45.0 | 95.0 | 2.3 | 55.0 | 4.0 | 3.4 | 41.8 |
| BC358 | Orion | 93 | 30.0 | 32.9 | 39.0 | 95.0 | 3.3 | 40.0 | 3.0 | 2.7 | 48.6 |
| BC016 | Bill Z | 2 | 29.8 | 35.3 | 41.0 | 96.0 | 5.0 | 21.7 | 1.0 | 3.0 | 44.8 |
| BC302 | ND-307 | 88 | 29.7 | 40.1 | 40.0 | 97.0 | 3.0 | 41.7 | 3.0 | 3.7 | 41.6 |
| BC299 | Maverick | 85 | 29.6 | 38.1 | 40.0 | 95.0 | 4.3 | 35.0 | 2.0 | 3.1 | 42.9 |
| BC080 | Matterhorn | 23 | 29.5 | 36.3 | 36.0 | 95.0 | 3.7 | 46.7 | 3.3 | 2.6 | 50.6 |
| BC216 | I9365-31 | 61 | 29.3 | 25.2 | 44.0 | 68.0 | 4.3 | 36.7 | 1.7 | 3.1 | 43.0 |
| BC124 | Shania | 35 | 29.1 | 20.5 | 45.0 | 102.0 | 2.3 | 61.7 | 3.7 | 3.1 | 37.1 |
| BC020 | Montrose | 4 | 29.0 | 39.2 | 45.0 | 95.0 | 3.7 | 18.3 | 1.0 | 2.3 | 50.7 |
| BC099 | S08418, ROSETTA | 54 | 28.9 | 32.5 | 44.0 | 96.0 | 2.3 | 50.0 | 3.7 | 2.7 | 47.7 |
| BC296 | GN9-4 | 82 | 28.9 | 38.2 | 45.0 | 96.0 | 2.3 | 51.7 | 4.0 | 3.0 | 45.5 |
| BC222 | Quincy | 62 | 28.8 | 40.6 | 44.0 | 98.0 | 4.7 | 30.0 | 1.0 | 3.1 | 41.8 |
| BC243 | USRM-20 | 71 | 28.8 | 41.5 | 44.0 | 98.0 | 4.7 | 36.7 | 1.7 | 3.2 | 39.0 |
| BC232 | NW-590 | 66 | 28.5 | 32.8 | 45.0 | 101.0 | 5.0 | 25.0 | 1.0 | 3.0 | 39.7 |
| BC079 | Kodiak | 22 | 28.4 | 43.4 | 44.0 | 95.0 | 4.0 | 33.3 | 2.3 | 2.9 | 48.1 |
| BC075 | Raven | 21 | 28.3 | 18.7 | 45.0 | 95.0 | 1.0 | 65.0 | 5.3 | 3.4 | 39.0 |
| BC290 | BAT 477 | 80 | 28.1 | 24.2 | 45.0 | 97.0 | 4.0 | 26.7 | 1.7 | 3.0 | 40.2 |
| BC196 | Chase | 58 | 28.1 | 35.5 | 43.0 | 95.0 | 5.0 | 23.3 | 1.0 | 3.2 | 40.7 |
| BC068 | Mayflower | 19 | 28.1 | 21.2 | 45.0 | 98.0 | 1.0 | 60.0 | 5.0 | 3.1 | 38.5 |
| BC038 | CENTA Pupil | 12 | 27.8 | 23.2 | 45.0 | 95.0 | 1.7 | 51.7 | 3.7 | 2.9 | 43.5 |
| BC091 | P07863, ELDORADO | 3 | 27.7 | 39.7 | 42.0 | 107.0 | 3.7 | 48.3 | 2.0 | 3.8 | 35.1 |
| BC088 | Zorro | 25 | 27.6 | 20.0 | 45.0 | 95.0 | 1.3 | 65.0 | 5.3 | 3.3 | 41.6 |
| BC267 | Victor | 73 | 27.6 | 33.9 | 45.0 | 103.0 | 5.0 | 26.7 | 1.0 | 4.6 | 28.0 |
| BC192 | Weihing | 55 | 27.6 | 35.8 | 39.0 | 97.0 | 3.3 | 38.3 | 2.3 | 2.9 | 40.1 |
| BC133 | Medalist | 38 | 27.6 | 19.1 | 43.0 | 98.0 | 2.0 | 63.3 | 5.3 | 3.3 | 40.5 |
| BC281 | Gloria | 77 | 27.4 | 35.0 | 46.0 | 102.0 | 5.0 | 28.3 | 1.0 | 3.3 | 36.1 |
| BC041 | Aifi Wuriti | 13 | 27.4 | 24.1 | 45.0 | 95.0 | 3.0 | 51.7 | 3.3 | 3.0 | 42.4 |
| BC142 | ROG 312 | 42 | 27.3 | 33.4 | 41.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.6 | 46.8 |
| BC307 | Eclipse | 90 | 27.2 | 20.8 | 45.0 | 95.0 | 1.0 | 55.0 | 5.0 | 2.5 | 46.9 |
| BC066 | C-20 | 18 | 27.1 | 20.4 | 46.0 | 107.0 | 3.7 | 48.3 | 2.7 | 4.0 | 33.8 |
| BC104 | 115M (Black Rhino) | 30 | 27.0 | 21.9 | 45.0 | 102.0 | 3.0 | 40.0 | 2.0 | 3.4 | 39.4 |

| EXPERIMENT 2115 IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | | PLANTED: 6/12/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC170 | UI-239 | 49 | 26.9 | 33.7 | 38.0 | 100.0 | 5.0 | 23.3 | 1.0 | 3.6 | 38.6 |
| BC236 | USPT-CBB-1 | 68 | 26.7 | 37.2 | 45.0 | 98.0 | 3.3 | 53.3 | 3.3 | 3.0 | 40.8 |
| BC131 | Pink Floyd | 37 | 26.5 | 35.1 | 36.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.5 | 48.8 |
| BC239 | USPT-CBB-5 | 69 | 26.5 | 33.2 | 36.0 | 95.0 | 4.3 | 26.7 | 1.3 | 2.7 | 41.7 |
| BC024 | Croissant | 7 | 26.3 | 33.1 | 47.0 | 98.0 | 3.7 | 50.0 | 3.0 | 2.5 | 44.4 |
| BC375 | Yolano | 94 | 26.2 | 32.9 | 41.0 | 95.0 | 5.0 | 23.3 | 1.0 | 2.8 | 43.6 |
| BC297 | GN9-1 | 83 | 26.2 | 40.4 | 44.0 | 103.0 | 4.7 | 36.7 | 1.0 | 3.6 | 35.0 |
| BC026 | DOR 364 | 8 | 26.1 | 23.0 | 45.0 | 95.0 | 3.0 | 45.0 | 4.3 | 2.8 | 43.6 |
| BC089 | Santa Fe | 26 | 26.1 | 41.6 | 38.0 | 97.0 | 3.7 | 41.7 | 3.0 | 2.9 | 43.3 |
| BC161 | Common Pinto | 45 | 26.0 | 34.6 | 42.0 | 96.0 | 5.0 | 21.7 | 1.0 | 2.8 | 41.6 |
| BC291 | SEA 10 | 81 | 25.9 | 35.4 | 41.0 | 98.0 | 5.0 | 21.7 | 1.0 | 3.0 | 42.3 |
| BC195 | ABCP-8 | 57 | 25.8 | 34.5 | 45.0 | 102.0 | 5.0 | 21.7 | 1.0 | 3.3 | 37.9 |
| BC204 | NE2-09-3 | 59 | 25.8 | 42.2 | 44.0 | 98.0 | 3.7 | 36.7 | 2.0 | 2.7 | 40.4 |
| BC178 | UI-114 | 52 | 25.8 | 35.9 | 45.0 | 95.0 | 5.0 | 21.7 | 1.0 | 3.0 | 45.3 |
| BC160 | UI-537 | 44 | 25.8 | 38.0 | 35.0 | 95.0 | 5.0 | 21.7 | 1.0 | 3.1 | 44.4 |
| BC109 | Poncho | 31 | 25.5 | 36.1 | 43.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.6 | 46.8 |
| BC022 | Shiny Crow | 5 | 25.3 | 21.7 | 45.0 | 98.0 | 4.3 | 26.7 | 1.7 | 2.8 | 37.4 |
| BC094 | Sedona | 29 | 25.1 | 37.5 | 45.0 | 95.0 | 4.0 | 45.0 | 3.3 | 2.8 | 39.8 |
| BC048 | F07-449-9-3 | 14 | 24.9 | 28.3 | 45.0 | 98.0 | 1.3 | 61.7 | 4.7 | 2.7 | 44.7 |
| BC280 | Harold | 76 | 24.9 | 33.4 | 45.0 | 110.0 | 5.0 | 38.3 | 1.0 | 5.0 | 24.5 |
| BC007 | BelNeb-RR-1 | 1 | 24.7 | 36.2 | 37.0 | 96.0 | 5.0 | 23.3 | 1.0 | 2.6 | 45.0 |
| BC164 | Kimberly | 47 | 24.7 | 35.1 | 44.0 | 96.0 | 4.3 | 23.3 | 1.3 | 2.5 | 44.0 |
| BC279 | Roza | 75 | 24.7 | 33.8 | 48.0 | 105.0 | 5.0 | 28.3 | 1.0 | 3.0 | 32.2 |
| BC138 | Marquis | 41 | 24.6 | 32.5 | 41.0 | 96.0 | 5.0 | 28.3 | 1.0 | 2.9 | 39.0 |
| BC162 | Common Red Mexican | 46 | 24.6 | 34.6 | 44.0 | 103.0 | 5.0 | 26.7 | 1.0 | 3.3 | 36.1 |
| BC228 | Nodak | 64 | 24.6 | 34.2 | 37.0 | 95.0 | 5.0 | 25.0 | 1.0 | 2.7 | 45.6 |
| BC127 | Schooner | 36 | 24.3 | 18.0 | 43.0 | 98.0 | 4.3 | 36.7 | 2.0 | 2.9 | 39.1 |
| BC278 | Viva | 74 | 24.3 | 30.1 | 45.0 | 115.0 | 5.0 | 30.0 | 1.0 | 5.1 | 24.2 |
| BC134 | Navigator | 39 | 24.0 | 21.7 | 45.0 | 95.0 | 1.0 | 65.0 | 5.3 | 2.7 | 42.8 |
| BC231 | Othello | 65 | 23.9 | 36.6 | 43.0 | 95.0 | 5.0 | 20.0 | 1.0 | 2.5 | 47.1 |
| I08959 | SER16 (CIAT) | 6 | 23.8 | 24.4 | 44.0 | 95.0 | 3.7 | 35.0 | 2.3 | 2.7 | 37.1 |
| BC301 | Stampede | 87 | 23.8 | 36.7 | 44.0 | 95.0 | 2.0 | 48.3 | 4.3 | 2.6 | 44.4 |
| BC111 | Buckskin | 33 | 23.8 | 38.1 | 43.0 | 95.0 | 5.0 | 23.3 | 1.0 | 2.7 | 41.7 |
| BC306 | Avalanche | 89 | 23.7 | 20.6 | 44.0 | 97.0 | 2.3 | 56.7 | 4.0 | 2.9 | 36.4 |
| BC242 | NW-63 | 70 | 23.6 | 34.5 | 44.0 | 108.0 | 5.0 | 25.0 | 1.0 | 3.2 | 34.8 |
| BC085 | Jaguar | 24 | 23.4 | 18.8 | 45.0 | 95.0 | 2.0 | 53.3 | 5.0 | 3.0 | 41.6 |
| BC174 | US-1140 | 50 | 23.3 | 34.2 | 36.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.8 | 43.2 |
| BC033 | PR 0443-151 | 10 | 23.3 | 19.5 | 45.0 | 99.0 | 3.0 | 46.7 | 3.3 | 3.3 | 34.3 |
| BC194 | Coyne | 56 | 23.1 | 37.1 | 45.0 | 98.0 | 2.7 | 50.0 | 3.3 | 3.1 | 34.7 |
| BC357 | Gemini | 92 | 23.0 | 30.4 | 35.0 | 97.0 | 4.7 | 31.7 | 1.3 | 3.4 | 33.6 |

| EXPERIMENT 2115 IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | PLANTED: 6/12/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC329 | CDC Crocus | 91 | 22.4 | 36.6 | 35.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.0 | 45.9 |
| BC053 | F04-2801-4-1-2 | 15 | 22.3 | 21.7 | 44.0 | 95.0 | 1.7 | 56.7 | 3.7 | 2.5 | 43.8 |
| BC092 | T-39 | 27 | 21.8 | 20.5 | 45.0 | 95.0 | 3.3 | 36.7 | 2.7 | 2.5 | 42.4 |
| BC056 | Seafarer | 16 | 21.7 | 19.2 | 42.0 | 99.0 | 3.0 | 51.7 | 3.3 | 3.2 | 34.9 |
| BC145 | Midnight | 43 | 21.6 | 18.9 | 47.0 | 99.0 | 2.7 | 50.0 | 3.0 | 2.8 | 32.2 |
| BC272 | Indeterminate Jamaica Red | 72 | 21.6 | 37.4 | 45.0 | 95.0 | 3.0 | 45.0 | 2.3 | 2.0 | 44.6 |
| BC176 | UI-59 | 51 | 21.5 | 31.9 | 45.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.2 | 41.7 |
| BC298 | PT9-17 | 84 | 21.1 | 38.5 | 44.0 | 98.0 | 4.0 | 36.7 | 2.3 | 2.1 | 45.5 |
| BC037 | IBC 301-204 | 11 | 20.9 | 25.6 | 44.0 | 95.0 | 3.3 | 33.3 | 2.3 | 1.9 | 42.1 |
| BC110 | Topaz | 32 | 20.5 | 35.9 | 35.0 | 95.0 | 5.0 | 35.0 | 1.3 | 2.1 | 44.7 |
| BC215 | A-55 | 60 | 20.3 | 26.5 | 49.0 | 112.0 | 1.3 | 70.0 | 3.3 | 4.0 | 23.3 |
| BC179 | UI-425 | 53 | 20.3 | 34.0 | 37.0 | 100.0 | 5.0 | 23.3 | 1.0 | 2.5 | 35.0 |
| I11207 | SER48 (CIAT) | 48 | 20.1 | 35.6 | 43.0 | 95.0 | 3.3 | 55.0 | 4.0 | 2.2 | 40.1 |
| BC137 | Beryl R | 40 | 19.6 | 28.9 | 41.0 | 102.0 | 4.7 | 30.0 | 1.0 | 2.6 | 34.4 |
| BC031 | Verano | 9 | 17.3 | 23.6 | 44.0 | 99.0 | 2.7 | 40.0 | 2.7 | 1.7 | 42.1 |
| BC224 | TARS-VCI-4B | 63 | 16.3 | 22.8 | 0.0 | 77.0 | 4.7 | 33.3 | 1.0 | 3.3 | 24.8 |
| MEAN (96) | | | 26.0 | 31.4 | 42.3 | 97.5 | 3.7 | 38.9 | 2.4 | 3.0 | 40.6 |
| LSD (0.05) | | | 3.9 | 1.9 | 3.1 | 12.2 | 0.9 | 10.3 | 0.9 | 0.7 | 5.2 |
| CV (%) | | | 11.2 | 4.5 | 4.4 | 9.3 | 17.7 | 19.6 | 28.7 | 18.1 | 9.4 |

| EXPERIMENT 2116 NON-IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | PLANTED: 6/12/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC028 | PR 0340-3-3-1 | 79 | 36.7 | 28.2 | 47.0 | 97.0 | 1.7 | 55.0 | 4.3 | 3.8 | 46.7 |
| BC234 | PT7-2 | 67 | 36.6 | 40.9 | 44.0 | 95.0 | 3.0 | 48.3 | 3.3 | 3.5 | 49.8 |
| BC387 | Medicine Hat | 96 | 35.7 | 42.3 | 42.0 | 95.0 | 3.3 | 43.3 | 3.3 | 2.9 | 50.1 |
| BC216 | I9365-31 | 61 | 35.4 | 26.4 | 45.0 | 102.0 | 3.7 | 40.0 | 2.3 | 4.2 | 37.8 |
| BC091 | P07863, ELDORADO | 3 | 34.9 | 41.9 | 45.0 | 98.0 | 1.7 | 58.3 | 4.3 | 4.2 | 35.6 |
| BC302 | ND-307 | 88 | 33.7 | 40.1 | 40.0 | 97.0 | 2.7 | 48.3 | 3.3 | 3.4 | 42.6 |
| BC079 | Kodiak | 22 | 33.5 | 43.0 | 42.0 | 95.0 | 3.3 | 35.0 | 2.3 | 3.0 | 48.6 |
| BC232 | NW-590 | 66 | 33.4 | 36.1 | 44.0 | 104.0 | 5.0 | 28.3 | 1.0 | 4.4 | 34.7 |
| BC104 | 115M (Black Rhino) | 30 | 33.2 | 23.0 | 45.0 | 103.0 | 4.0 | 41.7 | 2.3 | 3.9 | 40.9 |
| BC120 | La Paz | 34 | 32.8 | 38.3 | 43.0 | 95.0 | 2.0 | 58.3 | 4.3 | 3.3 | 42.6 |
| BC300 | Lariat | 86 | 31.9 | 43.8 | 44.0 | 100.0 | 3.0 | 45.0 | 3.7 | 3.8 | 38.8 |
| BC358 | Orion | 93 | 31.8 | 35.0 | 41.0 | 95.0 | 3.3 | 41.7 | 2.7 | 3.0 | 44.7 |
| BC124 | Shania | 35 | 31.8 | 20.3 | 45.0 | 95.0 | 1.7 | 50.0 | 4.3 | 3.7 | 37.2 |
| BC236 | USPT-CBB-1 | 68 | 31.7 | 39.8 | 45.0 | 96.0 | 4.0 | 48.3 | 3.0 | 3.2 | 41.7 |
| BC231 | Othello | 65 | 31.6 | 36.8 | 37.0 | 95.0 | 5.0 | 25.0 | 1.0 | 2.8 | 48.1 |
| BC062 | Domino | 17 | 31.2 | 19.2 | 46.0 | 95.0 | 1.7 | 58.3 | 5.0 | 3.1 | 43.4 |
| BC080 | Matterhorn | 23 | 31.1 | 37.6 | 37.0 | 95.0 | 3.0 | 43.3 | 4.0 | 3.0 | 46.5 |
| BC386 | Buster | 95 | 31.0 | 37.8 | 41.0 | 95.0 | 4.0 | 31.7 | 2.3 | 3.0 | 46.0 |
| BC286 | A285 | 78 | 30.8 | 22.8 | 45.0 | 98.0 | 4.0 | 45.0 | 2.3 | 3.1 | 42.9 |
| BC301 | Stampede | 87 | 30.4 | 39.7 | 44.0 | 97.0 | 1.0 | 61.7 | 4.7 | 2.7 | 43.8 |
| BC093 | Merlot | 28 | 30.4 | 39.8 | 45.0 | 98.0 | 2.7 | 48.3 | 4.0 | 4.1 | 37.0 |
| BC297 | GN9-1 | 83 | 30.2 | 43.0 | 44.0 | 100.0 | 4.7 | 38.3 | 1.3 | 3.8 | 38.2 |
| BC094 | Sedona | 29 | 30.0 | 41.6 | 45.0 | 95.0 | 3.0 | 38.3 | 3.0 | 3.4 | 38.9 |
| BC222 | Quincy | 62 | 30.0 | 42.1 | 43.0 | 98.0 | 5.0 | 25.0 | 1.0 | 3.2 | 43.8 |
| BC066 | C-20 | 18 | 29.9 | 20.0 | 45.0 | 101.0 | 3.3 | 41.7 | 3.7 | 4.1 | 35.4 |
| BC131 | Pink Floyd | 37 | 29.8 | 37.4 | 36.0 | 95.0 | 5.0 | 28.3 | 1.0 | 2.8 | 48.9 |
| BC142 | ROG 312 | 42 | 29.4 | 37.1 | 38.0 | 96.0 | 5.0 | 26.7 | 1.0 | 3.0 | 45.0 |
| BC307 | Eclipse | 90 | 29.4 | 21.0 | 43.0 | 95.0 | 1.0 | 51.7 | 5.7 | 3.1 | 43.8 |
| BC088 | Zorro | 25 | 29.4 | 20.7 | 45.0 | 95.0 | 1.7 | 51.7 | 4.7 | 3.1 | 44.2 |
| BC026 | DOR 364 | 8 | 29.4 | 23.7 | 44.0 | 96.0 | 2.0 | 51.7 | 3.3 | 2.9 | 45.8 |
| BC298 | PT9-17 | 84 | 29.3 | 38.1 | 42.0 | 95.0 | 4.0 | 38.3 | 1.7 | 2.6 | 45.5 |
| BC306 | Avalanche | 89 | 29.3 | 22.2 | 41.0 | 95.0 | 1.3 | 58.3 | 5.0 | 3.0 | 41.8 |
| BC243 | USRM-20 | 71 | 29.0 | 41.2 | 42.0 | 96.0 | 4.0 | 35.0 | 1.3 | 3.0 | 46.3 |
| BC196 | Chase | 58 | 28.8 | 38.0 | 43.0 | 95.0 | 5.0 | 25.0 | 1.0 | 2.7 | 44.5 |
| BC162 | Common Red Mexican | 46 | 28.7 | 35.2 | 43.0 | 103.0 | 5.0 | 28.3 | 1.0 | 3.2 | 37.2 |
| BC290 | BAT 477 | 80 | 28.4 | 26.3 | 41.0 | 100.0 | 3.3 | 36.7 | 2.0 | 2.7 | 43.1 |
| BC215 | A-55 | 60 | 28.3 | 27.0 | 46.0 | 112.0 | 1.3 | 68.3 | 4.0 | 4.7 | 27.1 |
| BC138 | Marquis | 41 | 28.3 | 33.5 | 42.0 | 98.0 | 5.0 | 31.7 | 1.3 | 3.0 | 41.1 |
| BC089 | Santa Fe | 26 | 28.2 | 44.3 | 39.0 | 95.0 | 3.7 | 35.0 | 2.3 | 2.8 | 43.3 |
| BC020 | Montrose | 4 | 28.1 | 39.1 | 44.0 | 95.0 | 5.0 | 20.0 | 1.0 | 2.2 | 51.6 |

| EXPERIMENT 2116 NON-IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | | PLANTED: 6/12/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC048 | F07-449-9-3 | 14 | 28.1 | 28.2 | 45.0 | 95.0 | 1.7 | 58.3 | 4.7 | 2.9 | 43.6 |
| BC299 | Maverick | 85 | 28.1 | 39.8 | 42.0 | 95.0 | 3.3 | 35.0 | 1.0 | 2.7 | 43.2 |
| BC024 | Croissant | 7 | 27.9 | 34.5 | 46.0 | 95.0 | 3.0 | 45.0 | 3.3 | 3.0 | 43.5 |
| BC296 | GN9-4 | 82 | 27.8 | 39.7 | 42.0 | 95.0 | 2.3 | 51.7 | 4.0 | 3.0 | 45.5 |
| BC280 | Harold | 76 | 27.7 | 35.9 | 45.0 | 107.0 | 5.0 | 31.7 | 1.0 | 5.5 | 22.8 |
| BC092 | T-39 | 27 | 27.7 | 21.1 | 44.0 | 95.0 | 4.0 | 35.0 | 2.3 | 2.5 | 47.6 |
| BC161 | Common Pinto | 45 | 27.6 | 36.9 | 43.0 | 95.0 | 5.0 | 21.7 | 1.0 | 3.0 | 43.6 |
| BC133 | Medalist | 38 | 27.4 | 19.6 | 42.0 | 97.0 | 3.3 | 45.0 | 4.0 | 3.7 | 38.7 |
| BC160 | UI-537 | 44 | 27.3 | 40.6 | 36.0 | 95.0 | 5.0 | 20.0 | 1.0 | 2.5 | 48.1 |
| BC174 | US-1140 | 50 | 27.3 | 38.4 | 36.0 | 96.0 | 5.0 | 21.7 | 1.0 | 2.5 | 47.5 |
| BC204 | NE2-09-3 | 59 | 27.2 | 43.1 | 41.0 | 97.0 | 3.0 | 38.3 | 2.0 | 2.7 | 40.7 |
| BC070 | Sierra | 20 | 27.0 | 35.3 | 43.0 | 101.0 | 4.0 | 41.7 | 1.7 | 3.8 | 31.5 |
| BC022 | Shiny Crow | 5 | 26.9 | 21.7 | 43.0 | 95.0 | 5.0 | 31.7 | 1.0 | 2.5 | 43.4 |
| BC007 | BelNeb-RR-1 | 1 | 26.9 | 38.8 | 38.0 | 95.0 | 5.0 | 18.3 | 1.0 | 2.6 | 46.7 |
| BC192 | Weihing | 55 | 26.8 | 44.2 | 41.0 | 97.0 | 3.7 | 38.3 | 2.7 | 3.0 | 38.1 |
| BC291 | SEA 10 | 81 | 26.8 | 35.1 | 40.0 | 97.0 | 5.0 | 23.3 | 1.0 | 2.6 | 42.6 |
| BC357 | Gemini | 92 | 26.7 | 35.8 | 35.0 | 96.0 | 4.7 | 31.7 | 1.3 | 2.7 | 41.3 |
| BC075 | Raven | 21 | 26.6 | 18.8 | 45.0 | 95.0 | 1.3 | 61.7 | 6.0 | 2.8 | 42.1 |
| BC242 | NW-63 | 70 | 26.5 | 33.4 | 43.0 | 105.0 | 5.0 | 25.0 | 1.0 | 3.7 | 34.0 |
| BC228 | Nodak | 64 | 26.5 | 37.0 | 36.0 | 95.0 | 5.0 | 25.0 | 1.0 | 2.8 | 44.2 |
| BC041 | Aifi Wuriti | 13 | 26.5 | 24.4 | 43.0 | 95.0 | 2.0 | 48.3 | 3.3 | 2.7 | 43.5 |
| BC099 | S08418, ROSETTA | 54 | 26.5 | 38.8 | 43.0 | 95.0 | 2.3 | 51.7 | 3.7 | 2.4 | 47.6 |
| BC145 | Midnight | 43 | 26.2 | 20.3 | 48.0 | 97.0 | 1.7 | 45.0 | 4.3 | 3.1 | 37.3 |
| BC170 | UI-239 | 49 | 26.1 | 33.7 | 42.0 | 97.0 | 5.0 | 21.7 | 1.0 | 2.8 | 39.5 |
| BC085 | Jaguar | 24 | 25.9 | 19.0 | 43.0 | 95.0 | 1.0 | 55.0 | 4.7 | 2.5 | 44.7 |
| BC375 | Yolano | 94 | 25.8 | 32.7 | 40.0 | 95.0 | 4.7 | 31.7 | 1.0 | 2.4 | 44.7 |
| BC278 | Viva | 74 | 25.5 | 32.0 | 45.0 | 112.0 | 5.0 | 25.0 | 1.0 | 5.9 | 20.1 |
| BC137 | Beryl R | 40 | 25.3 | 32.2 | 38.0 | 98.0 | 4.7 | 28.3 | 1.0 | 2.8 | 44.0 |
| BC068 | Mayflower | 19 | 25.2 | 21.7 | 43.0 | 95.0 | 1.0 | 63.3 | 5.7 | 2.8 | 41.2 |
| BC110 | Topaz | 32 | 25.1 | 38.0 | 36.0 | 95.0 | 4.3 | 33.3 | 2.0 | 2.4 | 45.5 |
| I08959 | SER16 (CIAT) | 6 | 24.9 | 26.6 | 41.0 | 95.0 | 3.7 | 38.3 | 2.7 | 2.4 | 45.9 |
| BC267 | Victor | 73 | 24.8 | 36.4 | 42.0 | 101.0 | 4.7 | 25.0 | 1.0 | 4.2 | 30.4 |
| BC239 | USPT-CBB-5 | 69 | 24.4 | 34.1 | 36.0 | 95.0 | 4.7 | 25.0 | 1.3 | 2.2 | 47.0 |
| BC195 | ABCP-8 | 57 | 24.3 | 33.4 | 0.0 | 103.0 | 4.7 | 28.3 | 1.0 | 2.9 | 37.8 |
| BC164 | Kimberly | 47 | 24.1 | 36.0 | 43.0 | 95.0 | 4.7 | 30.0 | 1.7 | 2.1 | 45.2 |
| BC176 | UI-59 | 51 | 24.1 | 39.1 | 44.0 | 95.0 | 5.0 | 23.3 | 1.0 | 2.6 | 44.3 |
| BC053 | F04-2801-4-1-2 | 15 | 23.9 | 23.5 | 42.0 | 95.0 | 1.0 | 48.3 | 4.3 | 2.4 | 45.5 |
| BC038 | CENTA Pupil | 12 | 23.9 | 24.1 | 43.0 | 95.0 | 1.7 | 43.3 | 3.7 | 2.1 | 47.6 |
| BC056 | Seafarer | 16 | 23.9 | 20.4 | 41.0 | 98.0 | 2.3 | 45.0 | 3.3 | 2.9 | 39.2 |
| BC134 | Navigator | 39 | 23.7 | 21.4 | 42.0 | 95.0 | 1.0 | 55.0 | 5.0 | 2.6 | 40.5 |

| EXPERIMENT 2116 NON-IRRIGATED DROUGHT YIELD TRIAL | | | | | | | | | PLANTED: 6/12/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX |
| BC111 | Buckskin | 33 | 23.6 | 40.7 | 38.0 | 95.0 | 5.0 | 18.3 | 1.0 | 2.6 | 43.4 |
| BC127 | Schooner | 36 | 23.3 | 20.4 | 38.0 | 101.0 | 4.3 | 33.3 | 1.3 | 3.0 | 37.3 |
| BC329 | CDC Crocus | 91 | 23.2 | 46.2 | 35.0 | 95.0 | 5.0 | 25.0 | 1.0 | 2.3 | 45.5 |
| BC194 | Coyne | 56 | 23.1 | 42.0 | 43.0 | 96.0 | 4.0 | 28.3 | 2.0 | 2.9 | 37.7 |
| BC016 | Bill Z | 2 | 22.8 | 37.4 | 40.0 | 95.0 | 5.0 | 21.7 | 1.0 | 2.4 | 43.2 |
| BC272 | Indeterminate Jamaica Red | 72 | 22.1 | 44.0 | 45.0 | 95.0 | 4.0 | 33.3 | 2.7 | 2.5 | 42.5 |
| BC109 | Poncho | 31 | 21.3 | 40.0 | 42.0 | 95.0 | 5.0 | 18.3 | 1.0 | 2.0 | 39.9 |
| BC224 | TARS-VCI-4B | 63 | 21.1 | 24.3 | 0.0 | 108.0 | 5.0 | 26.7 | 1.0 | 3.7 | 25.8 |
| BC033 | PR 0443-151 | 10 | 20.8 | 19.9 | 48.0 | 97.0 | 2.7 | 55.0 | 3.0 | 3.2 | 29.6 |
| BC037 | IBC 301-204 | 11 | 20.5 | 25.5 | 43.0 | 95.0 | 3.3 | 41.7 | 2.7 | 2.0 | 45.9 |
| BC178 | UI-114 | 52 | 20.5 | 36.8 | 44.0 | 95.0 | 5.0 | 18.3 | 1.0 | 2.0 | 39.3 |
| BC031 | Verano | 9 | 19.6 | 23.5 | 45.0 | 98.0 | 2.3 | 48.3 | 3.3 | 1.8 | 40.8 |
| BC179 | UI-425 | 53 | 19.2 | 42.3 | 40.0 | 103.0 | 5.0 | 23.3 | 1.0 | 3.1 | 29.8 |
| BC279 | Roza | 75 | 18.7 | 41.6 | 49.0 | 102.0 | 5.0 | 28.3 | 1.0 | 3.8 | 23.3 |
| I11207 | SER48 (CIAT) | 48 | 18.5 | 34.9 | 39.0 | 95.0 | 2.0 | 41.7 | 3.3 | 2.2 | 38.9 |
| BC281 | Gloria | 77 | 14.2 | 36.2 | 45.0 | 98.0 | 5.0 | 26.7 | 1.0 | 2.0 | 37.5 |
| MEAN (96) | | | 27.3 | 33.2 | 41.1 | 97.2 | 3.6 | 37.9 | 2.5 | 3.0 | 41.3 |
| LSD (0.05) | | | 4.0 | 1.9 | 2.7 | 3.9 | 0.9 | 8.7 | 0.9 | 0.7 | 4.9 |
| CV (%) | | | 10.9 | 4.2 | 3.9 | 3.0 | 17.5 | 16.9 | 28.1 | 17.2 | 8.7 |

| EXPERIMENT 2917 ORGANIC YIELD TRIAL-FINDLAY | | | | PLANTED: 6/12/12 | | |
|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY |
| N11226 | N05311*/B05044 | 6 | 24.9 | 17.7 | 49.0 | 92.0 |
| B11302 | N05311//B05055/B05053 | 34 | 23.1 | 21.9 | 47.0 | 90.0 |
| N11256 | N07009/MEDALIST | 13 | 21.7 | 18.3 | 48.0 | 89.0 |
| N11228 | N05311//N07009/N05324 | 7 | 20.3 | 16.7 | 49.0 | 89.0 |
| I07116 | T-39/Midnight, **SHANIA** | 36 | 20.3 | 18.6 | 48.0 | 91.0 |
| N11258 | N07009/MEDALIST | 2 | 19.2 | 18.3 | 49.0 | 89.0 |
| B11375 | B07104/B04391 | 32 | 18.8 | 21.5 | 48.0 | 88.0 |
| B11361 | B04644/B05066 | 33 | 18.6 | 17.3 | 47.0 | 85.0 |
| N11257 | N07009/MEDALIST | 14 | 18.2 | 17.9 | 50.0 | 91.0 |
| B09197 | B05055/B04588 | 23 | 17.8 | 18.6 | 48.0 | 87.0 |
| N11283 | MEDALIST/N08003 | 1 | 17.6 | 19.4 | 48.0 | 89.0 |
| B10244 | B04610/N05346 | 20 | 17.5 | 22.3 | 48.0 | 95.0 |
| B04554 | B00103*/X00822, **ZORRO** | 35 | 16.8 | 18.6 | 48.0 | 85.0 |
| N09020 | N05319/B04316 | 10 | 16.6 | 19.6 | 48.0 | 86.0 |
| N11284 | MEDALIST/N08003 | 12 | 16.4 | 19.8 | 48.0 | 86.0 |
| B09175 | N05311/B05055 | 19 | 16.1 | 23.6 | 48.0 | 85.0 |
| N11225 | N05311*/B05044 | 5 | 16.1 | 18.9 | 49.0 | 90.0 |
| B11588 | I82054/B07554 | 25 | 15.8 | 21.7 | 48.0 | 88.0 |
| B11334 | N07009//B04349/B05044 | 31 | 15.8 | 16.7 | 48.0 | 86.0 |
| N11298 | MEDALIST//B05054/B04588 | 3 | 15.8 | 17.4 | 49.0 | 86.0 |
| B11519 | I82054/B07554 | 27 | 15.3 | 19.8 | 55.0 | 94.0 |
| N11216 | N04158/B04265 | 4 | 14.8 | 21.3 | 48.0 | 90.0 |
| N11292 | N08006/MEDALIST | 15 | 14.0 | 17.8 | 50.0 | 90.0 |
| I92002 | C-20*3//GTS-0801/Seafarer, **VISTA** | 16 | 14.0 | 18.9 | 48.0 | 87.0 |
| N11232 | N05311//BMD12/B04587 | 9 | 13.7 | 16.6 | 48.0 | 88.0 |
| B09204 | B05054/B04588 | 22 | 12.9 | 21.2 | 47.0 | 86.0 |
| N09034 | B05055/B05070 | 11 | 12.9 | 21.2 | 48.0 | 87.0 |
| B09199 | B05055/B04587 | 21 | 12.2 | 19.9 | 48.0 | 88.0 |
| N11202 | N05324//N04109/N04158 | 8 | 11.7 | 24.4 | 48.0 | 89.0 |
| I08958 | Mayflower/Avanti, **MEDALIST** | 17 | 11.0 | 18.3 | 47.0 | 87.0 |
| B10243 | B04610/N05346 | 28 | 10.3 | 16.2 | 51.0 | 91.0 |
| B11363 | B04644/B07554 | 30 | 10.1 | 18.8 | 48.0 | 87.0 |
| I07112 | **R99 NO NOD** | 18 | 8.2 | 17.9 | 48.0 | 91.0 |
| B11343 | B07554//ZORRO/B05044 | 29 | 7.9 | 19.7 | 48.0 | 89.0 |
| B11611 | I82054/B07554 | 24 | 4.7 | 20.9 | 51.0 | 90.0 |
| B11552 | I82054/B07554 | 26 | 4.2 | 21.5 | 56.0 | 95.0 |
| MEAN (36) | | | 15.1 | 19.4 | 48.5 | 88.5 |
| LSD (0.05) | | | 4.3 | 2.0 | 1.4 | 3.6 |
| CV (%) | | | 20.8 | 6.2 | 1.7 | 2.4 |

| EXPERIMENT 2918 ORGANIC YIELD TRIAL-SATTELBERG | | | | | | | | PLANTED: 6/15/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| B11361 | B04644/B05066 | 33 | 18.1 | 19.0 | 45.0 | 88.0 | 2.0 | 52.5 | 5.5 | 1.0 |
| B11302 | N05311//B05055/B05053 | 34 | 17.1 | 20.7 | 49.0 | 90.0 | 1.0 | 60.0 | 5.5 | 0.5 |
| B09175 | N05311/B05055 | 19 | 16.7 | 22.9 | 50.0 | 91.0 | 2.0 | 52.5 | 3.0 | 0.0 |
| N11284 | MEDALIST/N08003 | 12 | 16.3 | 18.9 | 46.0 | 87.0 | 2.0 | 55.0 | 4.0 | 2.0 |
| B11375 | B07104/B04391 | 32 | 16.0 | 19.6 | 45.0 | 86.0 | 1.5 | 50.0 | 5.0 | 3.0 |
| N11283 | MEDALIST/N08003 | 1 | 16.0 | 18.8 | 49.0 | 88.0 | 2.0 | 60.0 | 4.5 | 3.5 |
| B09197 | B05055/B04588 | 23 | 15.8 | 19.4 | 45.0 | 90.0 | 1.5 | 47.5 | 4.0 | 0.0 |
| I92002 | C-20*3//GTS-0801/Seafarer, **VISTA** | 16 | 14.8 | 19.4 | 48.0 | 86.0 | 2.5 | 55.0 | 4.5 | 1.5 |
| B09199 | B05055/B04587 | 21 | 14.8 | 22.1 | 45.0 | 90.0 | 3.0 | 37.5 | 2.0 | 2.0 |
| B11334 | N07009//B04349/B05044 | 31 | 14.8 | 17.6 | 46.0 | 87.0 | 1.0 | 50.0 | 5.0 | 1.0 |
| B09204 | B05054/B04588 | 22 | 14.7 | 20.6 | 49.0 | 89.0 | 2.0 | 37.5 | 3.5 | 0.0 |
| N09034 | B05055/B05070 | 11 | 14.7 | 20.1 | 45.0 | 86.0 | 1.5 | 47.5 | 5.0 | 0.0 |
| N11228 | N05311//N07009/N05324 | 7 | 14.6 | 15.5 | 48.0 | 88.0 | 2.5 | 55.0 | 3.5 | 2.5 |
| N11232 | N05311//BMD12/B04587 | 9 | 14.4 | 17.3 | 48.0 | 90.0 | 1.0 | 55.0 | 4.5 | 3.0 |
| N11258 | N07009/MEDALIST | 2 | 14.2 | 18.0 | 49.0 | 91.0 | 1.5 | 60.0 | 5.0 | 0.0 |
| N11202 | N05324//N04109/N04158 | 8 | 14.2 | 23.5 | 46.0 | 90.0 | 1.5 | 55.0 | 4.5 | 0.5 |
| N11216 | N04158/B04265 | 4 | 14.2 | 21.4 | 47.0 | 97.0 | 2.5 | 60.0 | 2.5 | 1.0 |
| I08958 | Mayflower/Avanti, **MEDALIST** | 17 | 14.1 | 19.6 | 47.0 | 90.0 | 2.5 | 65.0 | 4.0 | 2.5 |
| N09020 | N05319/B04316 | 10 | 13.7 | 18.7 | 46.0 | 89.0 | 1.0 | 70.0 | 5.5 | 0.0 |
| B10244 | B04610/N05346 | 20 | 13.5 | 20.1 | 48.0 | 92.0 | 2.0 | 55.0 | 3.5 | 2.5 |
| I07116 | T-39/Midnight, **SHANIA** | 36 | 12.9 | 18.6 | 49.0 | 94.0 | 1.0 | 60.0 | 3.5 | 5.0 |
| N11256 | N07009/MEDALIST | 13 | 12.9 | 17.8 | 49.0 | 89.0 | 2.0 | 55.0 | 3.5 | 1.5 |
| B11588 | I82054/B07554 | 25 | 12.5 | 21.2 | 49.0 | 91.0 | 2.0 | 50.0 | 4.0 | 4.0 |
| B11343 | B07554//ZORRO/B05044 | 29 | 12.3 | 17.6 | 49.0 | 86.0 | 1.5 | 47.5 | 4.5 | 2.5 |
| N11257 | N07009/MEDALIST | 14 | 12.2 | 18.2 | 50.0 | 97.0 | 2.0 | 60.0 | 3.0 | 2.0 |
| B11363 | B04644/B07554 | 30 | 11.9 | 19.8 | 47.0 | 90.0 | 1.5 | 52.5 | 4.5 | 2.0 |
| N11298 | MEDALIST//B05054/B04588 | 3 | 11.6 | 17.6 | 50.0 | 88.0 | 1.5 | 50.0 | 5.0 | 3.0 |
| B04554 | B00103*/X00822, **ZORRO** | 35 | 11.3 | 18.5 | 50.0 | 88.0 | 1.0 | 52.5 | 5.5 | 3.0 |
| N11225 | N05311*/B05044 | 5 | 11.2 | 19.9 | 49.0 | 93.0 | 2.0 | 57.5 | 4.0 | 1.5 |
| B11519 | I82054/B07554 | 27 | 10.9 | 18.4 | 55.0 | 97.0 | 2.0 | 55.0 | 2.0 | 3.0 |
| N11226 | N05311*/B05044 | 6 | 10.9 | 18.7 | 49.0 | 94.0 | 2.0 | 62.5 | 4.0 | 3.0 |
| N11292 | N08006/MEDALIST | 15 | 10.3 | 16.2 | 48.0 | 90.0 | 1.5 | 50.0 | 4.0 | 4.0 |
| B11611 | I82054/B07554 | 24 | 9.8 | 20.9 | 52.0 | 93.0 | 2.0 | 65.0 | 2.5 | 3.5 |
| I07112 | **R99 NO NOD** | 18 | 9.2 | 19.4 | 45.0 | 92.0 | 2.0 | 60.0 | 3.5 | 2.0 |
| B10243 | B04610/N05346 | 28 | 9.0 | 17.2 | 49.0 | 93.0 | 1.0 | 50.0 | 3.0 | 3.5 |
| B11552 | I82054/B07554 | 26 | 6.1 | 22.7 | 56.0 | 99.0 | 2.5 | 60.0 | 1.5 | 1.0 |
| MEAN (36) | | | 13.3 | 19.3 | 48.0 | 90.3 | 1.8 | 54.7 | 4.0 | 2.0 |
| LSD (0.05) | | | 2.8 | 1.1 | 1.9 | 4.4 | 1.1 | 13.3 | 1.8 | 2.0 |
| CV (%) | | | 18.2 | 4.7 | 2.3 | 2.9 | 36.6 | 14.4 | 26.6 | 58.8 |

| EXPERIMENT 2219 STANDARD KIDNEY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| K11914 | K04604/USWK-CBB-17 | 2 | 40.6 | 60.1 | 39.0 | 94.0 | 1.0 | 45.7 | 5.0 | 3.3 |
| K11916 | K04607/USWK-CBB-17 | 8 | 38.2 | 55.2 | 38.0 | 94.0 | 1.0 | 44.7 | 5.0 | 1.0 |
| K11320 | K08222/CORNELL603 | 49 | 37.7 | 44.5 | 40.0 | 93.0 | 1.0 | 44.7 | 5.0 | 1.7 |
| K11909 | K06940/USWK-CBB-17 | 21 | 37.6 | 45.8 | 39.0 | 94.0 | 1.0 | 47.0 | 5.7 | 1.0 |
| K11919 | K04607/USWK-CBB-17 | 35 | 36.3 | 52.8 | 38.0 | 94.0 | 1.0 | 44.7 | 5.3 | 1.0 |
| K08961 | K04604/USDK-CBB-15, **SNOWDON** | 3 | 35.9 | 56.8 | 40.0 | 93.0 | 1.0 | 45.0 | 4.3 | 4.0 |
| K11917 | K04607/USWK-CBB-17 | 16 | 35.7 | 56.9 | 39.0 | 93.0 | 1.0 | 44.0 | 5.0 | 1.7 |
| K08222 | Red Hawk/USDK-CBB-15 | 30 | 35.5 | 54.0 | 42.0 | 96.0 | 1.7 | 48.3 | 5.3 | 1.0 |
| K11913 | K04604/USWK-CBB-17 | 24 | 35.1 | 56.7 | 40.0 | 93.0 | 1.0 | 46.0 | 4.3 | 4.0 |
| K08228 | K03271/USDK-CBB-15 | 20 | 34.8 | 51.0 | 41.0 | 98.0 | 1.5 | 48.6 | 3.0 | 3.0 |
| K11939 | K07929//K06014/K07715 | 22 | 33.6 | 65.4 | 39.0 | 92.0 | 1.0 | 45.1 | 4.0 | 3.3 |
| K11714 | K08601/K08233 | 14 | 32.5 | 57.8 | 43.0 | 98.0 | 1.0 | 48.7 | 5.0 | 1.0 |
| K11710 | K06012//K06014/K07715 | 17 | 31.1 | 47.8 | 40.0 | 95.0 | 1.3 | 46.7 | 3.7 | 3.3 |
| K11713 | K08601/K08233 | 34 | 30.3 | 53.7 | 44.0 | 99.0 | 1.0 | 49.3 | 5.0 | 1.3 |
| K11306 | K06621/USDK-CBB-15 | 32 | 30.3 | 52.0 | 40.0 | 97.0 | 1.0 | 47.7 | 5.7 | 1.7 |
| K90101 | CHAR/2*MONT, **RED HAWK** | 41 | 30.2 | 51.6 | 40.0 | 94.0 | 1.3 | 47.7 | 4.0 | 3.0 |
| K11921 | K04604/CHINOOK2000 | 1 | 29.9 | 56.1 | 39.0 | 92.0 | 1.0 | 45.1 | 4.0 | 4.0 |
| K11707 | K06621/USDK-CBB-15 | 51 | 29.7 | 52.4 | 40.0 | 96.0 | 1.7 | 47.3 | 5.3 | 1.7 |
| K11915 | K04604/USWK-CBB-17 | 15 | 29.5 | 52.9 | 40.0 | 93.0 | 1.0 | 45.7 | 4.3 | 3.3 |
| K11938 | K07929//K06014/K07715 | 40 | 29.5 | 62.0 | 40.0 | 96.0 | 1.0 | 46.1 | 4.0 | 4.0 |
| K11918 | K04607/USWK-CBB-17 | 4 | 29.3 | 53.0 | 37.0 | 93.0 | 1.0 | 45.3 | 5.0 | 3.7 |
| I10105 | Montcalm/DRK15, **MAJESTY** | 28 | 29.1 | 65.6 | 40.0 | 94.0 | 2.5 | 47.6 | 3.0 | 3.0 |
| K11709 | K06012//K06014/K07715 | 44 | 29.1 | 49.2 | 42.0 | 97.0 | 1.3 | 47.7 | 4.3 | 3.0 |
| I90013 | **CELRK** | 45 | 28.5 | 62.2 | 38.0 | 92.0 | 1.0 | 44.7 | 3.3 | 5.0 |
| K74002 | MDRK/CN(3)-HBR(NEB#1), **MONTCALM** | 56 | 28.1 | 52.0 | 40.0 | 96.0 | 1.3 | 47.3 | 3.0 | 3.3 |
| K11944 | K07926//C06819/X07804 | 6 | 28.0 | 56.6 | 41.0 | 93.0 | 1.0 | 45.6 | 4.0 | 3.3 |
| K11926 | X06115/X06114 | 25 | 27.9 | 51.5 | 41.0 | 95.0 | 1.3 | 47.7 | 4.3 | 3.3 |
| K01234 | Mutant of Red Hawk, **REDCOAT** | 47 | 27.1 | 56.1 | 40.0 | 95.0 | 1.0 | 47.1 | 4.0 | 3.3 |
| I11201 | Pink Panther//ZAA/Montcalm, **CLOUSEAU** | 10 | 26.8 | 52.9 | 40.0 | 92.0 | 1.0 | 48.1 | 2.0 | 5.0 |
| K11937 | K07929//K06014/K07715 | 26 | 25.9 | 68.6 | 38.0 | 99.0 | 1.0 | 48.0 | 3.7 | 2.7 |
| K11303 | Red Hawk//K06003/CBB-15 | 11 | 25.8 | 47.6 | 41.0 | 94.0 | 1.3 | 45.0 | 3.0 | 3.0 |
| K11908 | K06940/USWK-CBB-17 | 12 | 25.8 | 45.4 | 38.0 | 91.0 | 1.0 | 46.1 | 4.0 | 4.3 |
| K11906 | K07303/USWK-CBB-17 | 23 | 25.7 | 52.8 | 41.0 | 95.0 | 1.3 | 47.7 | 4.0 | 4.0 |
| K11942 | K07926//C06819/X07804 | 38 | 25.7 | 60.4 | 40.0 | 92.0 | 1.0 | 47.6 | 4.0 | 4.0 |
| K94601 | CN49242/3*MONT//REDKLOUD,**CHINOOK2000** | 55 | 25.6 | 49.2 | 40.0 | 97.0 | 1.0 | 47.6 | 2.0 | 3.3 |
| K11941 | K07926//C06819/X07804 | 5 | 24.6 | 59.2 | 39.0 | 92.0 | 1.0 | 45.6 | 3.5 | 4.3 |
| K11301 | K06001/ND02-385-14 | 19 | 23.8 | 60.9 | 40.0 | 92.0 | 1.3 | 47.3 | 4.0 | 3.3 |
| K11943 | K07926//C06819/X07804 | 18 | 23.5 | 66.4 | 39.0 | 93.0 | 1.0 | 46.1 | 3.5 | 4.0 |
| K11803 | K07926//C06819/X07804 | 7 | 23.5 | 61.6 | 39.0 | 92.0 | 1.0 | 46.1 | 5.0 | 4.0 |
| K11701 | K05616/K04604//K03240/JALOLISTRAPRETAS | 39 | 23.3 | 52.5 | 46.0 | 100.0 | 1.0 | 48.3 | 2.7 | 3.0 |

| EXPERIMENT 2219 STANDARD KIDNEY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| K11922 | K03601/K04607 | 36 | 23.2 | 63.2 | 39.0 | 93.0 | 1.0 | 44.0 | 4.0 | 4.7 |
| K11704 | K05616/K05614//REDHAWK/JALO VERMILLO | 33 | 23.1 | 51.3 | 43.0 | 95.0 | 1.0 | 48.3 | 3.7 | 2.7 |
| K11312 | K06012//I07135/K07303 | 48 | 23.1 | 57.9 | 40.0 | 97.0 | 1.0 | 47.3 | 3.7 | 3.7 |
| K90902 | BEA/50B1807//LASSEN, **BELUGA** | 52 | 22.4 | 52.4 | 42.0 | 99.0 | 1.0 | 48.7 | 3.7 | 3.3 |
| K11309 | K06012/USDK-CBB-15 | 53 | 22.2 | 55.6 | 42.0 | 95.0 | 1.3 | 47.7 | 4.0 | 3.7 |
| K11708 | CHINOOK2000/USDK-CBB-15 | 50 | 22.0 | 49.7 | 41.0 | 97.0 | 1.0 | 46.3 | 2.0 | 3.3 |
| K11302 | K07303/USWK-CBB-17 | 31 | 21.7 | 56.1 | 40.0 | 95.0 | 1.0 | 47.7 | 4.0 | 3.7 |
| K11912 | Red Hawk/X06167 | 43 | 21.3 | 51.8 | 42.0 | 97.0 | 1.0 | 48.0 | 4.0 | 3.7 |
| K11907 | K07303/USWK-CBB-17 | 46 | 21.1 | 44.7 | 40.0 | 93.0 | 1.0 | 45.0 | 3.3 | 4.0 |
| K11802 | K07926//C06819/X07804 | 29 | 20.8 | 72.0 | 39.0 | 93.0 | 1.3 | 46.3 | 4.0 | 4.0 |
| K11804 | K07926//C06819/X07804 | 27 | 19.9 | 72.9 | 38.0 | 93.0 | 1.7 | 47.0 | 3.3 | 4.0 |
| K11712 | K06012//K06014/K07715 | 9 | 18.9 | 51.3 | 40.0 | 94.0 | 1.7 | 47.0 | 4.3 | 4.0 |
| K11319 | K08222/CORNELL603 | 42 | 18.7 | 47.1 | 41.0 | 96.0 | 1.0 | 46.6 | 5.0 | 2.3 |
| K08907 | K03244/I05103 | 13 | 18.4 | 48.3 | 41.0 | 94.0 | 1.0 | 48.6 | 4.0 | 4.3 |
| K11923 | K99974/XANA | 37 | 17.1 | 76.1 | 39.0 | 92.0 | 1.0 | 45.1 | 4.0 | 4.0 |
| K11925 | K99974/XANA | 54 | 15.9 | 76.5 | 39.0 | 92.0 | 1.0 | 46.1 | 3.5 | 3.3 |
| MEAN (56) | | | 27.3 | 56.0 | 40.1 | 94.5 | 1.1 | 46.7 | 4.0 | 3.2 |
| LSD (0.05) | | | 5.6 | 4.6 | 1.7 | 2.0 | 0.5 | 1.9 | 0.8 | 0.7 |
| CV (%) | | | 15.0 | 6.1 | 3.1 | 1.6 | 29.3 | 3.0 | 15.2 | 16.5 |

| EXPERIMENT 2220 STANDARD CRANBERRY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| C11260 | C07401//CBB-20/C05617 | 4 | 39.0 | 55.2 | 39.0 | 94.0 | 2.0 | 45.3 | 5.0 | 1.7 |
| C11320 | C05617/CBB-20 | 27 | 38.0 | 53.0 | 39.0 | 93.0 | 1.3 | 44.0 | 5.3 | 2.0 |
| C11273 | C07403//CBB-20/C06812 | 17 | 36.3 | 53.6 | 39.0 | 95.0 | 2.0 | 48.3 | 6.0 | 1.3 |
| C11266 | C07401//CBB-20/C05653 | 19 | 35.2 | 55.3 | 39.0 | 94.0 | 1.3 | 48.3 | 6.3 | 1.3 |
| C11258 | C07401//CBB-20/C05617 | 28 | 35.0 | 56.5 | 39.0 | 93.0 | 1.0 | 44.0 | 5.0 | 3.0 |
| C11264 | C07401//CBB-20/C05653 | 29 | 34.8 | 54.5 | 39.0 | 95.0 | 1.7 | 47.3 | 5.0 | 2.7 |
| C11383 | CBB-20/C07414 | 51 | 34.8 | 56.0 | 38.0 | 94.0 | 1.3 | 47.0 | 4.7 | 3.3 |
| C11259 | C07401//CBB-20/C05617 | 23 | 34.3 | 55.6 | 39.0 | 93.0 | 2.0 | 45.3 | 5.3 | 1.7 |
| C11222 | C05631/C07411 | 3 | 32.9 | 60.4 | 39.0 | 95.0 | 1.0 | 46.7 | 4.0 | 3.3 |
| C11314 | CAPRI/CBB-20 | 2 | 32.7 | 56.3 | 38.0 | 94.0 | 1.7 | 47.0 | 5.0 | 2.0 |
| C11261 | C07401//CBB-20/C05617 | 22 | 32.0 | 53.2 | 38.0 | 93.0 | 1.7 | 44.3 | 5.0 | 2.7 |
| C11388 | C08712/C07403 | 54 | 32.0 | 50.8 | 39.0 | 94.0 | 1.3 | 48.0 | 4.0 | 3.0 |
| C11274 | C07403//CBB-20/C06812 | 14 | 30.8 | 56.7 | 39.0 | 94.0 | 1.0 | 46.3 | 4.3 | 2.0 |
| C11305 | C07413//CBB-20/C05617 | 16 | 30.8 | 52.9 | 39.0 | 94.0 | 1.0 | 47.7 | 5.7 | 3.3 |
| C11317 | CAPRI/CBB-20 | 18 | 30.6 | 55.0 | 38.0 | 94.0 | 1.7 | 46.0 | 5.0 | 2.3 |
| C11276 | C07403//CBB-20/C06812 | 9 | 30.0 | 58.2 | 40.0 | 94.0 | 1.7 | 48.3 | 4.0 | 3.0 |
| C11368 | Capri/C08716 | 52 | 29.8 | 57.2 | 40.0 | 93.0 | 2.0 | 48.3 | 3.3 | 3.7 |
| C11369 | C99833/C08716 | 50 | 29.3 | 54.4 | 39.0 | 92.0 | 1.3 | 48.7 | 4.0 | 3.7 |
| C11321 | C05617/CBB-20 | 34 | 29.0 | 53.4 | 39.0 | 92.0 | 1.7 | 44.7 | 4.7 | 3.7 |
| C11319 | C05617/CBB-20 | 38 | 29.0 | 54.9 | 39.0 | 93.0 | 1.0 | 43.7 | 4.7 | 4.0 |
| C11212 | C05617/C07411 | 15 | 28.9 | 54.8 | 38.0 | 94.0 | 1.0 | 48.0 | 4.0 | 3.3 |
| C11375 | C08706/C08712 | 63 | 28.7 | 56.1 | 39.0 | 93.0 | 1.0 | 46.7 | 5.0 | 4.0 |
| C11263 | C07401//CBB-20/C05617 | 44 | 28.7 | 53.9 | 39.0 | 93.0 | 1.3 | 44.0 | 4.7 | 2.7 |
| C11269 | C07401//CBB-20/C05653 | 20 | 28.5 | 56.2 | 39.0 | 93.0 | 1.7 | 45.0 | 4.3 | 3.3 |
| C11284 | C07403//BD1002/C07403 | 24 | 28.2 | 62.2 | 38.0 | 92.0 | 1.3 | 46.3 | 3.7 | 4.0 |
| C11275 | C07403//CBB-20/C06812 | 26 | 28.2 | 53.8 | 39.0 | 94.0 | 1.7 | 46.3 | 4.0 | 3.0 |
| I92014 | **ETNA** | 21 | 28.0 | 60.1 | 39.0 | 92.0 | 1.0 | 44.3 | 3.3 | 5.0 |
| C11223 | CAPRI/X06150 | 6 | 27.9 | 52.7 | 39.0 | 95.0 | 1.0 | 45.0 | 4.7 | 2.7 |
| C11228 | C05653/CBB-20 | 30 | 27.4 | 57.2 | 39.0 | 92.0 | 1.0 | 46.3 | 4.0 | 4.7 |
| C11393 | C07403/C08717 | 60 | 27.1 | 59.6 | 39.0 | 92.0 | 1.3 | 45.7 | 3.3 | 3.0 |
| C11204 | C05631//C05603/CBB-20 | 10 | 27.1 | 57.1 | 39.0 | 93.0 | 1.0 | 46.3 | 4.3 | 4.0 |
| C11373 | C08706/C08712 | 55 | 27.0 | 56.1 | 39.0 | 93.0 | 1.0 | 46.7 | 4.7 | 3.3 |
| C11392 | C07403/C08717 | 57 | 26.4 | 60.7 | 39.0 | 92.0 | 1.7 | 45.7 | 3.3 | 4.0 |
| C11216 | C06820/C05617 | 40 | 26.0 | 53.3 | 39.0 | 93.0 | 1.0 | 45.7 | 4.0 | 3.7 |
| C11347 | C08706/CBB-20 | 53 | 26.0 | 57.7 | 39.0 | 93.0 | 1.0 | 44.0 | 3.7 | 4.0 |
| C11219 | BELLAGIO/X07801 | 12 | 25.9 | 58.4 | 39.0 | 92.0 | 1.0 | 46.3 | 4.0 | 4.3 |
| C11247 | BELLAGIO//X07801/C07403 | 37 | 25.9 | 49.1 | 40.0 | 91.0 | 1.0 | 46.7 | 4.3 | 3.7 |
| C11206 | C05631//C05603/CBB-20 | 35 | 25.9 | 54.5 | 39.0 | 93.0 | 1.3 | 47.7 | 4.7 | 4.0 |
| C11221 | C06818/C07411 | 1 | 25.7 | 49.4 | 40.0 | 93.0 | 1.0 | 48.3 | 4.3 | 3.7 |
| C11374 | C08706/C08712 | 59 | 25.7 | 60.2 | 38.0 | 92.0 | 1.0 | 45.0 | 4.7 | 4.0 |

| EXPERIMENT 2220 STANDARD CRANBERRY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| C11371 | C07414/C08706 | 58 | 25.6 | 55.3 | 38.0 | 92.0 | 1.0 | 44.0 | 4.3 | 4.3 |
| C11309 | C07413//BD1002/BELLAGIO | 42 | 25.6 | 47.7 | 39.0 | 92.0 | 1.0 | 45.7 | 4.3 | 4.0 |
| C11252 | BELLAGIO//C05647/X07804 | 39 | 25.4 | 60.5 | 40.0 | 93.0 | 1.3 | 47.3 | 3.7 | 4.0 |
| C11203 | C05631//C05603/CBB-20 | 45 | 25.1 | 55.5 | 39.0 | 92.0 | 1.0 | 46.7 | 3.7 | 4.3 |
| C11225 | C05603/CBB-20 | 31 | 25.0 | 46.5 | 41.0 | 93.0 | 1.3 | 45.7 | 3.0 | 4.0 |
| C11257 | C07401//CBB-20/C05617 | 7 | 24.9 | 57.5 | 39.0 | 93.0 | 1.3 | 44.0 | 4.0 | 3.3 |
| C11286 | C07403//C05647/X07801 | 47 | 24.8 | 59.3 | 39.0 | 93.0 | 1.0 | 44.7 | 3.7 | 3.3 |
| C11268 | C07401//CBB-20/C05653 | 13 | 24.8 | 53.0 | 39.0 | 93.0 | 2.0 | 44.7 | 4.0 | 3.7 |
| C11346 | C08706/CBB-20 | 56 | 24.7 | 60.4 | 38.0 | 92.0 | 1.0 | 42.3 | 4.0 | 4.3 |
| C11339 | C08706/C07403 | 62 | 24.5 | 59.0 | 40.0 | 92.0 | 1.0 | 45.7 | 3.7 | 4.0 |
| C99833 | CARDINAL/K94803,**CAPRI** | 41 | 24.3 | 59.6 | 40.0 | 94.0 | 1.0 | 47.7 | 3.7 | 3.3 |
| C11240 | BELLAGIO//BD1002/BELLAGIO | 11 | 24.0 | 57.6 | 38.0 | 92.0 | 1.0 | 47.0 | 4.7 | 4.0 |
| C11231 | C05631//C05647/X07804 | 43 | 23.0 | 54.1 | 40.0 | 92.0 | 1.0 | 44.0 | 3.3 | 5.0 |
| C11241 | BELLAGIO//BD1002/BELLAGIO | 8 | 23.0 | 57.0 | 39.0 | 91.0 | 1.0 | 48.0 | 4.3 | 4.3 |
| C11255 | C07401//CBB-20/C05617 | 46 | 23.0 | 55.3 | 40.0 | 92.0 | 1.0 | 45.3 | 4.0 | 4.3 |
| C11312 | C07413//BD1002/BELLAGIO | 32 | 22.9 | 52.0 | 39.0 | 92.0 | 1.0 | 46.0 | 4.3 | 4.0 |
| C11387 | C08717/C07414 | 61 | 22.4 | 51.3 | 39.0 | 91.0 | 1.3 | 46.7 | 3.7 | 4.7 |
| C11310 | C07413//BD1002/BELLAGIO | 25 | 22.2 | 49.6 | 39.0 | 92.0 | 1.0 | 44.3 | 4.0 | 4.3 |
| C11389 | C07403/C08717 | 64 | 22.1 | 48.1 | 39.0 | 93.0 | 1.0 | 45.3 | 4.3 | 3.3 |
| C11233 | C05631//C05647/X07804 | 33 | 22.0 | 55.3 | 39.0 | 91.0 | 1.0 | 43.0 | 4.0 | 5.0 |
| C11201 | C03157//C05603/CBB-20 | 5 | 21.4 | 57.1 | 39.0 | 92.0 | 1.0 | 47.7 | 4.0 | 4.3 |
| C11202 | C05631//C05603/CBB-20 | 36 | 21.3 | 59.0 | 41.0 | 93.0 | 1.0 | 43.7 | 3.3 | 3.7 |
| C11226 | C03157/CAPRI | 48 | 18.3 | 58.6 | 39.0 | 92.0 | 1.0 | 43.0 | 3.7 | 4.0 |
| I11259 | **UCD 0801** | 49 | 9.6 | 51.2 | 48.0 | 103.0 | 1.0 | 50.0 | 1.0 | 3.7 |
| MEAN (64) | | | 27.3 | 54.7 | 39.2 | 93.0 | 1.2 | 46.0 | 4.2 | 3.5 |
| LSD (0.05) | | | 4.3 | 9.3 | 1.1 | 1.2 | 0.3 | 1.4 | 0.5 | 0.5 |
| CV (%) | | | 11.5 | 12.6 | 2.0 | 0.9 | 18.3 | 2.3 | 9.5 | 11.0 |

| EXPERIMENT 2221 PRELIMINARY KIDNEY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | CBB (1-5) |
| K08961 | K04604/USDK-CBB-15, **SNOWDON** | 55 | 36.3 | 66.1 | 38.0 | 92.0 | 2.0 | 48.0 | 6.0 | 4.0 |
| K12803 | K07921//K08971/K08233 | 30 | 36.1 | 54.1 | 38.0 | 93.0 | 1.0 | 45.0 | 5.0 | 1.5 |
| K12810 | K08901//K08929/K08222 | 37 | 34.8 | 57.1 | 40.0 | 95.0 | 1.0 | 48.0 | 5.7 | 2.5 |
| K12203 | K08233//K08220/K06012 | 3 | 33.2 | 48.1 | 42.0 | 96.0 | 2.0 | 48.3 | 4.7 | 2.0 |
| K12801 | USWK-CBB-17//K08929/K08222 | 28 | 32.9 | 43.6 | 40.0 | 93.0 | 1.0 | 45.7 | 5.3 | 2.0 |
| K12805 | K08222//K08222/K08974 | 32 | 31.8 | 56.6 | 41.0 | 98.0 | 1.3 | 48.0 | 4.7 | 1.5 |
| K12222 | K08222/K07713 | 22 | 31.2 | 57.7 | 40.0 | 94.0 | 2.3 | 47.7 | 4.0 | 3.5 |
| K12201 | K08222//K08220/K06012 | 1 | 31.1 | 56.3 | 42.0 | 98.0 | 2.3 | 47.7 | 4.0 | 2.0 |
| K12602 | K06619/K08222 | 27 | 31.0 | 49.1 | 43.0 | 98.0 | 1.7 | 49.0 | 4.3 | 2.5 |
| K12219 | K06001/Red Hawk | 19 | 30.9 | 54.0 | 40.0 | 93.0 | 1.7 | 46.7 | 4.0 | 3.5 |
| K12811 | K08901//K08929/K08222 | 38 | 30.9 | 54.9 | 38.0 | 93.0 | 1.0 | 46.0 | 5.7 | 1.5 |
| K12205 | K08233//K08220/K06012 | 5 | 30.5 | 57.2 | 41.0 | 96.0 | 1.7 | 48.0 | 4.7 | 2.0 |
| K12812 | K08901//K08929/K08222 | 39 | 30.4 | 54.9 | 38.0 | 92.0 | 1.0 | 45.7 | 5.0 | 4.5 |
| K12225 | K08222/CORNELL 603 | 25 | 30.4 | 45.1 | 40.0 | 92.0 | 1.0 | 45.7 | 6.0 | 1.0 |
| K12206 | K08233//K08220/K08233 | 6 | 30.3 | 49.5 | 40.0 | 94.0 | 2.3 | 45.7 | 4.0 | 2.0 |
| K12807 | K08233//K08220/K08974 | 34 | 30.3 | 55.9 | 39.0 | 98.0 | 1.3 | 48.0 | 5.3 | 2.5 |
| K12601 | Red Hawk//K08601/K08233 | 26 | 30.3 | 57.4 | 41.0 | 96.0 | 2.7 | 47.3 | 4.0 | 3.0 |
| K12802 | USWK-CBB-17//K08929/K08222 | 29 | 30.3 | 47.7 | 39.0 | 94.0 | 1.0 | 46.0 | 6.0 | 2.5 |
| K90101 | CHAR/2*MONT, **RED HAWK** | 52 | 30.1 | 54.0 | 40.0 | 93.0 | 1.7 | 47.3 | 4.0 | 4.5 |
| K12813 | K08901//K08929/K08222 | 40 | 29.7 | 61.5 | 39.0 | 92.0 | 1.0 | 44.7 | 5.7 | 4.5 |
| K12209 | K08233//K08222/K08601 | 9 | 28.8 | 51.4 | 42.0 | 97.0 | 2.7 | 47.3 | 3.7 | 3.0 |
| K12207 | K08233//K08220/K08974 | 7 | 28.5 | 59.0 | 39.0 | 96.0 | 2.0 | 46.7 | 4.3 | 2.0 |
| K12815 | USWK-CBB-17//K06619/K08233 | 42 | 27.9 | 41.4 | 40.0 | 99.0 | 1.3 | 48.7 | 4.3 | 2.0 |
| K12806 | K08222//K08971/K08233 | 33 | 27.8 | 46.3 | 43.0 | 99.0 | 1.3 | 49.0 | 4.0 | 3.0 |
| K12820 | K07926//C06819/X07804 | 47 | 27.4 | 71.1 | 39.0 | 92.0 | 1.0 | 45.3 | 4.7 | 4.5 |
| K74002 | MDRK/CN(3)-HBR(NEB#1), **MONTCALM** | 53 | 27.4 | 57.8 | 42.0 | 100.0 | 3.0 | 48.0 | 3.3 | 4.0 |
| K12220 | Red Hawk/K06001 | 20 | 27.3 | 57.6 | 40.0 | 95.0 | 2.0 | 47.0 | 3.7 | 4.5 |
| K12822 | K07926//C06819/X07804 | 49 | 27.2 | 59.3 | 40.0 | 92.0 | 2.3 | 45.7 | 4.7 | 4.5 |
| K12814 | K08901//K08929/K08222 | 41 | 27.0 | 59.1 | 38.0 | 93.0 | 1.0 | 46.7 | 5.3 | 3.5 |
| K12212 | Red Hawk//K07713/K08222 | 12 | 26.9 | 47.2 | 45.0 | 92.0 | 2.0 | 45.7 | 3.3 | 4.5 |
| K12218 | Red Hawk/USWK-CBB-17 | 18 | 26.5 | 52.8 | 41.0 | 94.0 | 1.0 | 47.7 | 4.0 | 5.0 |
| K12214 | Red Hawk//K08220/K08233 | 14 | 25.9 | 55.7 | 40.0 | 93.0 | 1.7 | 45.7 | 4.0 | 4.0 |
| K12217 | Red Hawk/K08233 | 17 | 25.9 | 50.7 | 42.0 | 96.0 | 1.3 | 47.0 | 4.0 | 3.5 |
| K12221 | Red Hawk/K06001 | 21 | 25.7 | 56.5 | 41.0 | 96.0 | 2.7 | 47.7 | 3.3 | 4.5 |
| I11201 | Pink Panther//ZAA/Montcalm, **CLOUSEAU** | 56 | 25.7 | 61.9 | 40.0 | 93.0 | 1.7 | 46.7 | 3.0 | 5.0 |
| K12204 | K08233//K08220/K06012 | 4 | 25.6 | 57.4 | 39.0 | 96.0 | 2.3 | 47.7 | 4.3 | 2.0 |
| K12808 | K08601//K08929/K08222 | 35 | 25.4 | 52.9 | 41.0 | 97.0 | 1.3 | 48.0 | 4.3 | 4.0 |
| K12824 | K07926//K07303/I07136 | 51 | 25.2 | 78.3 | 39.0 | 92.0 | 1.0 | 44.0 | 4.3 | 5.0 |
| K12210 | K08233//K08222/K08601 | 10 | 25.1 | 47.9 | 42.0 | 96.0 | 2.3 | 46.7 | 3.7 | 4.0 |
| K12804 | K08222//K08222/K08974 | 31 | 24.8 | 56.2 | 43.0 | 99.0 | 1.7 | 49.0 | 4.3 | 1.5 |
| K12215 | Red Hawk//K08222/K08601 | 15 | 24.7 | 45.8 | 41.0 | 94.0 | 2.0 | 48.3 | 3.7 | 4.5 |

| EXPERIMENT 2221 PRELIMINARY KIDNEY YIELD TRIAL | | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **NAME** | **PEDIGREE** | **ENTRY** | **YIELD CWT /ACRE** | **100 SEED WT. (g)** | **DAYS TO FLOWER** | **DAYS TO MATURITY** | **LODGING (1-5)** | **HEIGHT (cm)** | **DES. SCORE** | **CBB (1-5)** |
| K12816 | USWK-CBB-17//K06619/K08233 | 43 | 24.4 | 40.1 | 41.0 | 96.0 | 1.0 | 48.0 | 5.0 | 1.5 |
| K12819 | K08601/USWK-CBB-17 | 46 | 24.3 | 57.5 | 40.0 | 98.0 | 1.3 | 48.3 | 4.7 | 2.0 |
| K12821 | K07926//C06819/X07804 | 48 | 24.3 | 61.2 | 39.0 | 93.0 | 1.7 | 46.7 | 5.0 | 4.5 |
| K12224 | K08222/K06001 | 24 | 23.5 | 58.4 | 42.0 | 98.0 | 2.3 | 48.0 | 4.0 | 1.5 |
| K12216 | Red Hawk//K08222/K08601 | 16 | 23.3 | 47.5 | 40.0 | 93.0 | 1.3 | 46.3 | 3.3 | 5.0 |
| K12202 | K08233//K06619/K08233 | 2 | 23.3 | 56.7 | 40.0 | 97.0 | 2.3 | 46.3 | 4.0 | 3.0 |
| K12823 | K07926//K07303/I07136 | 50 | 23.1 | 77.7 | 39.0 | 93.0 | 1.7 | 45.3 | 3.0 | 5.0 |
| K12809 | K08601//K08929/K08222 | 36 | 23.0 | 48.6 | 43.0 | 97.0 | 1.7 | 48.0 | 4.3 | 3.5 |
| K12208 | K08233//K08220/K08974 | 8 | 22.9 | 55.3 | 41.0 | 96.0 | 1.3 | 47.0 | 4.7 | 2.0 |
| K12818 | USWK-CBB-17//K06619/K08233 | 45 | 22.6 | 45.3 | 40.0 | 99.0 | 1.3 | 49.3 | 4.3 | 2.0 |
| K12211 | K08601//K08971/K08233 | 11 | 22.0 | 56.2 | 42.0 | 94.0 | 1.3 | 47.7 | 4.0 | 4.0 |
| K12817 | USWK-CBB-17//K06619/K08233 | 44 | 21.1 | 42.8 | 45.0 | 100.0 | 1.3 | 49.0 | 4.0 | 2.0 |
| K90902 | BEA/50B1807//LASSEN, **BELUGA** | 54 | 20.9 | 55.6 | 42.0 | 99.0 | 1.7 | 49.0 | 3.3 | 4.0 |
| K12213 | Red Hawk//K08220/K08233 | 13 | 20.4 | 55.0 | 41.0 | 95.0 | 2.3 | 47.3 | 3.3 | 4.0 |
| K12223 | K08222/K07713 | 23 | 18.7 | 47.8 | 47.0 | 97.0 | 2.3 | 46.7 | 3.3 | 4.0 |
| MEAN (56) | | | 27.3 | 54.5 | 40.6 | 95.3 | 1.7 | 47.1 | 4.3 | 3.2 |
| LSD (0.05) | | | 5.0 | 4.0 | 1.6 | 2.3 | 0.7 | 1.5 | 0.9 | 0.9 |
| CV (%) | | | 13.6 | 5.4 | 2.9 | 1.8 | 29.1 | 2.4 | 15.3 | 16.8 |

| EXPERIMENT 2222 PRELIMINARY MAYACOBA YIELD TRIAL | | | | | | | PLANTED: 6/13/12 | | |
|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE |
| X11402 | FR-07-AZP-14-03 | 3 | 16.1 | 46.2 | 41.0 | 92.0 | 1.0 | 44.7 | 4.3 |
| X11404 | FR-07-AZP-14-05 | 4 | 16.1 | 46.8 | 41.0 | 92.0 | 1.0 | 45.0 | 4.0 |
| I11236 | MYASI | 5 | 15.7 | 35.5 | 42.0 | 91.0 | 2.3 | 42.0 | 3.0 |
| X11405 | FR-07-AZP-14-06 | 1 | 15.5 | 47.0 | 41.0 | 92.0 | 1.0 | 44.7 | 3.7 |
| X11401 | FR-07-AZP-14-02 | 2 | 15.4 | 46.2 | 41.0 | 92.0 | 1.0 | 45.0 | 4.3 |
| MEAN (5) | | | 15.8 | 44.3 | 41.2 | 91.9 | 1.3 | 44.3 | 3.9 |
| LSD (0.05) | | | 4.8 | 2.2 | 1.0 | 1.1 | 0.4 | 1.2 | 1.2 |
| CV (%) | | | 19.9 | 3.2 | 1.6 | 0.8 | 20.4 | 1.8 | 20.6 |

| EXPERIMENT 2223 NATIONAL WHITE MOLD YIELD TRIAL | | | | | | | | PLANTED: 6/14/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | WM SCORE | WM % |
| P07863 | AN-37/P02630, **ELDORADO** | 1 | 42.9 | 40.1 | 41.0 | 105.0 | 2.0 | 56.0 | 5.7 | 2.0 | 22.2 |
| I10125 | ND080547 | 7 | 42.6 | 32.2 | 41.0 | 103.0 | 2.3 | 49.0 | 4.0 | 4.7 | 51.8 |
| I08933 | 37-2, USPT-WM-12 | 9 | 42.0 | 38.5 | 40.0 | 100.0 | 2.3 | 49.3 | 5.0 | 4.0 | 44.4 |
| B11363 | B04644/B07554 | 26 | 40.1 | 22.1 | 41.0 | 102.0 | 1.3 | 56.0 | 5.0 | 3.7 | 40.7 |
| S11701 | S04504/R06420 | 31 | 39.9 | 32.7 | 40.0 | 100.0 | 2.0 | 51.0 | 5.3 | 4.7 | 51.8 |
| I12321 | PS02-028A-3-B2 | 12 | 38.6 | 38.9 | 39.0 | 99.0 | 2.0 | 48.3 | 5.0 | 4.0 | 44.4 |
| P07793 | I02545/P02647 | 55 | 38.1 | 38.1 | 40.0 | 103.0 | 2.0 | 51.7 | 4.0 | 2.7 | 29.6 |
| G11464 | G07309//G07302/BMN13 | 36 | 37.9 | 43.4 | 39.0 | 98.0 | 1.7 | 50.7 | 5.3 | 6.7 | 74.0 |
| I07113 | PNE-6-94-75/Kodiak, **LAPAZ** | 57 | 37.7 | 35.0 | 43.0 | 101.0 | 1.7 | 56.0 | 5.0 | 4.0 | 44.4 |
| G08254 | G04514/Matterhorn | 34 | 35.9 | 36.7 | 40.0 | 99.0 | 1.7 | 51.0 | 5.0 | 4.3 | 48.1 |
| B07103 | 8615, TL | 49 | 35.1 | 23.7 | 42.0 | 105.0 | 1.7 | 55.7 | 3.7 | 2.3 | 25.9 |
| B05001 | 8690, TL | 47 | 33.3 | 24.3 | 45.0 | 105.0 | 2.7 | 53.0 | 3.3 | 2.3 | 25.9 |
| P04205 | P99119/G99750, **SANTA FE** | 58 | 33.3 | 41.3 | 40.0 | 99.0 | 2.0 | 48.7 | 4.3 | 6.7 | 74.0 |
| B07105 | 8563, TW | 51 | 33.3 | 22.8 | 46.0 | 105.0 | 1.7 | 56.3 | 4.3 | 2.7 | 29.6 |
| N11232 | N05311//BMD12/B04587 | 19 | 33.1 | 19.6 | 42.0 | 103.0 | 1.7 | 56.7 | 5.7 | 2.0 | 22.2 |
| I98402 | **TACANA** | 46 | 33.1 | 21.9 | 46.0 | 104.0 | 1.7 | 52.3 | 3.7 | 1.7 | 18.5 |
| I10126 | PS02-050-2 | 64 | 33.1 | 33.7 | 40.0 | 101.0 | 1.3 | 52.3 | 5.0 | 3.0 | 33.3 |
| N11216 | N04158/B04265 | 24 | 32.9 | 23.2 | 45.0 | 103.0 | 1.3 | 56.0 | 5.0 | 2.3 | 25.9 |
| P08161 | MATTERHORN/EMP 507 | 28 | 32.9 | 36.3 | 44.0 | 101.0 | 2.7 | 48.7 | 3.7 | 7.0 | 77.7 |
| G09303 | G04207/P05437 | 33 | 32.8 | 31.2 | 39.0 | 99.0 | 1.7 | 55.0 | 5.0 | 5.3 | 59.2 |
| B11334 | N07009//B04349/B05044 | 16 | 32.6 | 19.4 | 40.0 | 102.0 | 1.7 | 56.0 | 5.0 | 4.7 | 51.8 |
| B11331 | VCW54 SELECTION | 35 | 32.0 | 23.0 | 43.0 | 105.0 | 2.3 | 50.0 | 3.3 | 7.3 | 81.4 |
| N11298 | MEDALIST//B05054/B04588 | 21 | 31.6 | 18.8 | 45.0 | 103.0 | 1.7 | 58.0 | 5.3 | 3.0 | 33.3 |
| B10244 | B04610/N05346 | 13 | 31.5 | 22.6 | 42.0 | 101.0 | 1.7 | 56.3 | 5.7 | 4.0 | 44.4 |
| B09175 | N05311/B05055 | 25 | 31.4 | 24.8 | 46.0 | 102.0 | 1.3 | 59.0 | 5.3 | 2.3 | 25.9 |
| N11283 | MEDALIST/N08003 | 22 | 31.3 | 19.5 | 46.0 | 102.0 | 1.3 | 61.0 | 6.0 | 2.0 | 22.2 |
| N11226 | N05311*/B05044 | 23 | 31.0 | 19.1 | 46.0 | 104.0 | 2.0 | 57.0 | 5.0 | 2.7 | 29.6 |
| B10213 | B04587//ZORRO/DPC-1 | 14 | 30.9 | 20.9 | 41.0 | 100.0 | 1.3 | 52.0 | 5.0 | 3.0 | 33.3 |
| B07104 | 8543, TW | 50 | 30.8 | 22.0 | 43.0 | 104.0 | 1.7 | 54.7 | 3.7 | 3.0 | 33.3 |
| B11343 | B07554//ZORRO/B05044 | 17 | 30.1 | 21.2 | 41.0 | 101.0 | 1.7 | 50.7 | 4.7 | 3.7 | 40.7 |
| G08160 | Matterhorn/E507 | 30 | 30.0 | 35.1 | 40.0 | 99.0 | 2.7 | 47.3 | 4.0 | 5.7 | 62.9 |
| S08418 | S02754/S04503, **ROSETTA** | 2 | 29.8 | 32.2 | 43.0 | 99.0 | 1.7 | 53.3 | 5.3 | 3.3 | 37.0 |
| B11355 | JAGUAR/B04644 | 27 | 29.3 | 20.3 | 43.0 | 101.0 | 1.7 | 55.0 | 4.7 | 4.0 | 44.4 |
| P11522 | P04203/P06125 | 29 | 29.2 | 38.1 | 40.0 | 99.0 | 1.7 | 52.0 | 5.0 | 4.0 | 44.4 |
| B07102 | 8661, TL | 48 | 28.1 | 20.8 | 45.0 | 105.0 | 1.7 | 54.0 | 3.7 | 3.3 | 37.0 |
| B04554 | B00103*/X00822, **ZORRO** | 56 | 27.7 | 24.0 | 44.0 | 103.0 | 2.0 | 53.3 | 4.7 | 3.7 | 40.7 |
| C11221 | C06818/C07411 | 37 | 26.8 | 60.6 | 40.0 | 99.0 | 1.0 | 50.0 | 5.0 | 1.7 | 18.5 |
| I12319 | VRW 32 | 10 | 26.6 | 26.2 | 42.0 | 105.0 | 2.0 | 49.0 | 3.0 | 2.7 | 29.6 |
| R98026 | R94037/R94161, **MERLOT** | 61 | 26.5 | 36.5 | 43.0 | 105.0 | 2.0 | 54.0 | 4.0 | 4.7 | 51.8 |
| I08958 | Mayflower/Avanti, **MEDALIST** | 53 | 26.2 | 19.1 | 43.0 | 105.0 | 2.3 | 53.3 | 3.7 | 2.3 | 25.9 |

| EXPERIMENT 2223 NATIONAL WHITE MOLD YIELD TRIAL | | | | | | | PLANTED: 6/14/12 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | WM SCORE | WM % |
| I12301 | **INDI** | 54 | 26.1 | 20.4 | 45.0 | 103.0 | 1.7 | 55.0 | 4.0 | 3.0 | 33.3 |
| I10124 | ND060514 | 6 | 25.9 | 20.8 | 40.0 | 100.0 | 2.0 | 48.3 | 3.0 | 4.3 | 48.1 |
| N11258 | N07009/MEDALIST | 20 | 25.6 | 18.9 | 47.0 | 103.0 | 1.7 | 57.7 | 5.3 | 2.7 | 29.6 |
| G93414 | **MATTERHORN** | 59 | 25.2 | 33.2 | 40.0 | 98.0 | 2.0 | 48.3 | 5.0 | 6.0 | 66.6 |
| I11264 | COOP 03019, **MERLIN** | 52 | 24.6 | 20.1 | 45.0 | 104.0 | 1.7 | 54.0 | 3.7 | 2.7 | 29.6 |
| I12320 | Z0726-9-74 | 11 | 24.5 | 31.8 | 40.0 | 99.0 | 1.7 | 45.7 | 3.0 | 3.3 | 37.0 |
| I81010 | JAPON3/MAGDALENE, **BUNSI** | 3 | 24.5 | 21.3 | 41.0 | 100.0 | 2.7 | 47.0 | 3.7 | 6.0 | 66.6 |
| K11714 | K08601/K08233 | 44 | 24.4 | 62.4 | 41.0 | 105.0 | 1.0 | 53.3 | 4.3 | 3.0 | 33.3 |
| B11301 | N05311//B05055/B05053 | 15 | 24.0 | 21.4 | 44.0 | 103.0 | 1.3 | 56.0 | 5.3 | 1.7 | 18.5 |
| N11228 | N05311//N07009/N05324 | 18 | 23.8 | 18.2 | 44.0 | 104.0 | 2.3 | 54.3 | 4.3 | 4.7 | 51.8 |
| K08961 | K04604/USDK-CBB-15, **SNOWDON** | 39 | 23.5 | 66.9 | 39.0 | 98.0 | 1.0 | 48.0 | 5.0 | 2.0 | 22.2 |
| S00809 | R94142/X94076, **SEDONA** | 60 | 23.3 | 38.6 | 44.0 | 101.0 | 3.3 | 49.3 | 3.3 | 5.3 | 59.2 |
| K11303 | Red Hawk//K06003/CBB-15 | 42 | 22.7 | 58.6 | 39.0 | 103.0 | 1.0 | 50.7 | 4.3 | 2.0 | 22.2 |
| I89011 | RB, **BERYL** | 4 | 22.6 | 34.2 | 40.0 | 99.0 | 4.3 | 42.0 | 3.0 | 9.0 | 99.9 |
| K11914 | K04604/USWK-CBB-17 | 41 | 22.2 | 65.7 | 39.0 | 102.0 | 1.0 | 50.7 | 4.7 | 2.3 | 25.9 |
| K11301 | K06001/ND02-385-14 | 45 | 22.0 | 68.9 | 40.0 | 104.0 | 1.3 | 48.7 | 4.0 | 2.7 | 29.6 |
| K90902 | BEA/50B1807//LASSEN, **BELUGA** | 40 | 21.4 | 58.0 | 42.0 | 105.0 | 1.0 | 52.7 | 3.7 | 3.0 | 33.3 |
| C11314 | CAPRI/CBB-20 | 38 | 21.0 | 56.6 | 39.0 | 98.0 | 1.0 | 47.3 | 4.0 | 4.7 | 51.8 |
| C99833 | CARDINAL/K94803, **CAPRI** | 62 | 20.3 | 63.0 | 40.0 | 101.0 | 1.3 | 48.7 | 3.7 | 2.3 | 25.9 |
| K90101 | CHAR/2*MONT, **RED HAWK** | 63 | 20.2 | 58.7 | 40.0 | 103.0 | 1.0 | 49.0 | 4.0 | 2.3 | 25.9 |
| K11712 | K06012//K06014/K07715 | 43 | 20.1 | 55.1 | 40.0 | 102.0 | 1.0 | 49.7 | 4.7 | 2.7 | 29.6 |
| S11610 | R06412//S07501/R06422 | 32 | 19.6 | 33.6 | 42.0 | 100.0 | 2.7 | 48.7 | 4.0 | 8.3 | 92.5 |
| I96417 | G122 MAGNUSON | 5 | 18.4 | 39.8 | 43.0 | 106.0 | 1.3 | 51.3 | 2.7 | 3.3 | 37.0 |
| I06217 | A195 | 8 | 16.1 | 66.5 | 51.0 | 110.0 | 1.0 | 54.7 | 1.0 | 1.7 | 18.5 |
| MEAN (64) | | | 29.1 | 34.3 | 42.1 | 102.0 | 1.8 | 52.2 | 4.4 | 3.7 | 40.9 |
| LSD (0.05) | | | 14.2 | 6.1 | 4.0 | 1.3 | 31.0 | 4.4 | 13.2 | 38.0 | 38.0 |
| CV (%) | | | 5.6 | 2.9 | 2.3 | 1.8 | 0.7 | 3.1 | 0.8 | 1.9 | 21.0 |

| EXPERIMENT 2425 BNF YIELD TRIAL | | | | | | | | | PLANTED: 6/19/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX | VIGOR (1-5) |
| B11536 | I82054/B07554 | 35 | 26.5 | 24.5 | 50.0 | 98.0 | 2.5 | 60.0 | 4.0 | 3.0 | 40.1 | 4.0 |
| B11582 | I82054/B07554 | 80 | 25.8 | 20.7 | 52.0 | 99.0 | 1.0 | 60.0 | 5.5 | 3.3 | 37.5 | 4.0 |
| I07112 | **R99 NO NOD** | 125 | 24.9 | 21.6 | 46.0 | 100.0 | 2.5 | 60.0 | 3.5 | 3.8 | 34.3 | 3.0 |
| B11545 | I82054/B07554 | 43 | 24.8 | 22.3 | 48.0 | 98.0 | 1.0 | 80.0 | 5.0 | 3.1 | 33.8 | 4.0 |
| B11620 | I82054/B07554 | 116 | 24.7 | 24.9 | 48.0 | 99.0 | 3.5 | 60.0 | 2.5 | 3.6 | 35.6 | 4.0 |
| B11603 | I82054/B07554 | 100 | 23.9 | 26.5 | 50.0 | 107.0 | 2.0 | 70.0 | 2.0 | 3.4 | 28.8 | 3.0 |
| B11519 | I82054/B07554 | 18 | 23.7 | 22.3 | 55.0 | 99.0 | 2.0 | 55.0 | 3.5 | 2.6 | 39.3 | 3.0 |
| B11544 | I82054/B07554 | 42 | 23.2 | 25.1 | 53.0 | 99.0 | 2.0 | 60.0 | 4.0 | 2.8 | 37.2 | 3.0 |
| B11602 | I82054/B07554 | 99 | 23.2 | 25.8 | 56.0 | 100.0 | 3.0 | 65.0 | 3.5 | 3.3 | 35.6 | 3.0 |
| B11609 | I82054/B07554 | 106 | 23.0 | 22.6 | 49.0 | 101.0 | 2.5 | 70.0 | 3.0 | 4.7 | 32.8 | 4.0 |
| B11571 | I82054/B07554 | 69 | 23.0 | 23.2 | 55.0 | 103.0 | 1.0 | 80.0 | 5.0 | 3.0 | 30.5 | 4.0 |
| B11565 | I82054/B07554 | 63 | 22.9 | 23.9 | 49.0 | 100.0 | 2.0 | 75.0 | 4.0 | 2.8 | 35.9 | 3.0 |
| B11549 | I82054/B07554 | 47 | 22.4 | 23.2 | 49.0 | 99.0 | 2.0 | 55.0 | 3.5 | 3.1 | 35.2 | 4.0 |
| B11555 | I82054/B07554 | 53 | 22.2 | 25.8 | 49.0 | 100.0 | 1.5 | 85.0 | 4.5 | 3.7 | 33.0 | 5.0 |
| B11557 | I82054/B07554 | 55 | 22.0 | 23.6 | 48.0 | 99.0 | 3.0 | 65.0 | 2.5 | 4.4 | 22.2 | 4.0 |
| B11610 | I82054/B07554 | 107 | 21.9 | 29.3 | 51.0 | 102.0 | 2.5 | 55.0 | 3.0 | 3.4 | 28.3 | 3.0 |
| B11567 | I82054/B07554 | 65 | 21.8 | 24.8 | 57.0 | 102.0 | 3.0 | 50.0 | 3.5 | 3.1 | 35.4 | 3.0 |
| B11611 | I82054/B07554 | 108 | 21.7 | 26.4 | 52.0 | 101.0 | 2.0 | 80.0 | 3.5 | 3.5 | 30.6 | 3.0 |
| B11594 | I82054/B07554 | 92 | 21.7 | 25.1 | 49.0 | 97.0 | 3.0 | 40.0 | 2.5 | 2.2 | 40.1 | 3.0 |
| B11511 | I82054/B07554 | 10 | 21.6 | 24.9 | 53.0 | 101.0 | 3.0 | 70.0 | 3.0 | 5.4 | 21.0 | 3.0 |
| I11271 | **10IS-2423** | 129 | 21.6 | 25.5 | 46.0 | 96.0 | 2.0 | 55.0 | 3.5 | 2.3 | 43.5 | 3.0 |
| B11590 | I82054/B07554 | 88 | 21.5 | 21.1 | 51.0 | 98.0 | 1.0 | 65.0 | 5.0 | 2.7 | 33.8 | 4.0 |
| B11563 | I82054/B07554 | 61 | 21.3 | 25.9 | 49.0 | 102.0 | 1.5 | 75.0 | 3.5 | 5.1 | 24.2 | 4.0 |
| B11570 | I82054/B07554 | 68 | 21.3 | 23.9 | 50.0 | 97.0 | 1.0 | 65.0 | 6.0 | 2.8 | 35.7 | 4.0 |
| B11531 | I82054/B07554 | 30 | 21.2 | 24.8 | 49.0 | 106.0 | 3.5 | 80.0 | 3.5 | 4.4 | 26.1 | 3.0 |
| B11556 | I82054/B07554 | 54 | 21.1 | 21.8 | 45.0 | 99.0 | 1.0 | 55.0 | 4.5 | 2.4 | 37.1 | 3.0 |
| B11546 | I82054/B07554 | 44 | 20.9 | 23.6 | 56.0 | 109.0 | 3.0 | 70.0 | 1.5 | 4.9 | 21.0 | 4.0 |
| B11527 | I82054/B07554 | 26 | 20.9 | 28.9 | 50.0 | 53.0 | 3.0 | 60.0 | 2.5 | 2.8 | 35.6 | 4.0 |
| I10149 | **VERANO** | 127 | 20.8 | 24.3 | 45.0 | 104.0 | 2.0 | 55.0 | 2.5 | 3.2 | 31.8 | 3.0 |
| B11543 | I82054/B07554 | 41 | 20.8 | 22.6 | 49.0 | 98.0 | 1.5 | 80.0 | 4.5 | 3.7 | 29.1 | 4.0 |
| B11616 | I82054/B07554 | 113 | 20.7 | 22.0 | 55.0 | 100.0 | 1.0 | 80.0 | 5.0 | 2.8 | 40.3 | 4.0 |
| I08958 | **MEDALIST** | 130 | 20.6 | 20.8 | 47.0 | 98.0 | 1.5 | 65.0 | 5.0 | 3.7 | 29.5 | 3.0 |
| B11595 | I82054/B07554 | 93 | 20.5 | 26.6 | 50.0 | 100.0 | 3.0 | 65.0 | 2.5 | 4.0 | 24.0 | 4.0 |
| B11530 | I82054/B07554 | 29 | 20.5 | 22.2 | 50.0 | 102.0 | 2.0 | 80.0 | 3.5 | 3.0 | 32.1 | 4.0 |
| B11593 | I82054/B07554 | 91 | 20.4 | 22.5 | 49.0 | 102.0 | 2.5 | 65.0 | 4.0 | 4.1 | 21.2 | 3.0 |
| B11509 | I82054/B07554 | 8 | 20.4 | 22.4 | 50.0 | 98.0 | 1.0 | 70.0 | 5.5 | 3.0 | 30.8 | 3.0 |
| B11581 | I82054/B07554 | 79 | 20.4 | 25.2 | 51.0 | 108.0 | 3.0 | 55.0 | 2.5 | 3.2 | 26.3 | 3.0 |
| B11574 | I82054/B07554 | 72 | 20.3 | 26.2 | 57.0 | 109.0 | 4.0 | 55.0 | 1.0 | 4.2 | 18.9 | 4.0 |
| B11523 | I82054/B07554 | 22 | 20.2 | 28.8 | 47.0 | 100.0 | 2.5 | 45.0 | 3.5 | 2.5 | 36.2 | 3.0 |
| B11568 | I82054/B07554 | 66 | 20.1 | 25.9 | 51.0 | 110.0 | 2.0 | 65.0 | 2.5 | 6.7 | 16.7 | 4.0 |
| B11539 | I82054/B07554 | 37 | 20.1 | 24.6 | 48.0 | 99.0 | 2.0 | 60.0 | 3.0 | 4.6 | 31.6 | 2.0 |
| B11617 | I82054/B07554 | 114 | 20.0 | 21.1 | 46.0 | 96.0 | 1.0 | 60.0 | 5.5 | 1.8 | 48.4 | 3.0 |
| B11547 | I82054/B07554 | 45 | 20.0 | 25.0 | 49.0 | 96.0 | 1.5 | 60.0 | 3.5 | 2.0 | 45.1 | 3.0 |
| B11592 | I82054/B07554 | 90 | 19.9 | 22.9 | 49.0 | 99.0 | 1.0 | 65.0 | 3.5 | 3.3 | 29.3 | 4.0 |
| B11584 | I82054/B07554 | 82 | 19.7 | 21.1 | 51.0 | 104.0 | 2.5 | 75.0 | 2.5 | 4.1 | 23.1 | 4.0 |

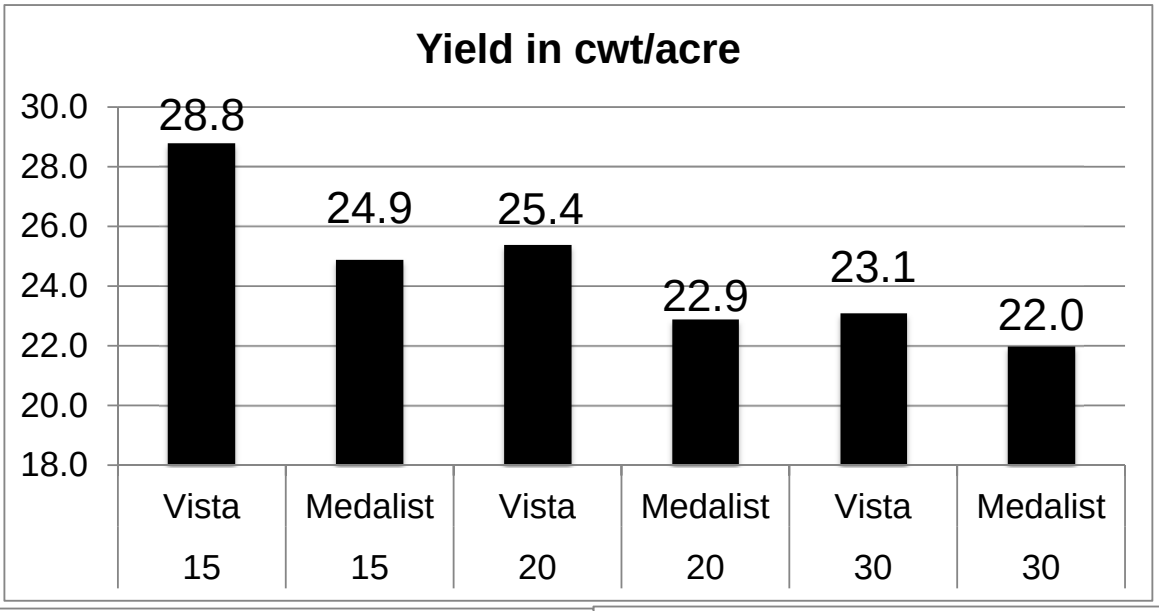
| EXPERIMENT 2425 BNF YIELD TRIAL | | | | | | | | | PLANTED: 6/19/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX | VIGOR (1-5) |
| B11588 | I82054/B07554 | 86 | 19.6 | 25.2 | 52.0 | 99.0 | 1.5 | 65.0 | 4.5 | 2.9 | 35.3 | 4.0 |
| B11607 | I82054/B07554 | 104 | 19.6 | 20.5 | 47.0 | 100.0 | 1.0 | 65.0 | 4.5 | 2.4 | 34.1 | 4.0 |
| B11526 | I82054/B07554 | 25 | 19.5 | 23.1 | 48.0 | 99.0 | 2.0 | 75.0 | 4.0 | 2.3 | 34.0 | 4.0 |
| I09129 | **PR0443-151** | 126 | 19.4 | 22.1 | 49.0 | 97.0 | 2.0 | 55.0 | 3.5 | 2.0 | 40.9 | 3.0 |
| B11532 | I82054/B07554 | 31 | 19.2 | 25.3 | 55.0 | 105.0 | 3.0 | 60.0 | 2.5 | 3.5 | 24.1 | 4.0 |
| B11601 | I82054/B07554 | 98 | 19.2 | 26.5 | 49.0 | 99.0 | 3.0 | 60.0 | 2.5 | 4.5 | 19.7 | 4.0 |
| B11621 | I82054/B07554 | 117 | 19.1 | 22.4 | 49.0 | 99.0 | 1.5 | 50.0 | 4.0 | 3.1 | 30.8 | 4.0 |
| B11553 | I82054/B07554 | 51 | 18.9 | 24.5 | 53.0 | 108.0 | 3.5 | 55.0 | 2.5 | 3.5 | 21.6 | 3.0 |
| B11596 | I82054/B07554 | 94 | 18.9 | 21.5 | 49.0 | 98.0 | 1.0 | 70.0 | 4.5 | 2.7 | 33.0 | 4.0 |
| B11566 | I82054/B07554 | 64 | 18.8 | 23.7 | 50.0 | 103.0 | 2.0 | 70.0 | 3.5 | 3.2 | 27.7 | 4.0 |
| B11569 | I82054/B07554 | 67 | 18.7 | 21.3 | 49.0 | 97.0 | 3.0 | 55.0 | 3.0 | 2.3 | 33.3 | 4.0 |
| B11589 | I82054/B07554 | 87 | 18.7 | 21.5 | 49.0 | 98.0 | 1.0 | 75.0 | 5.0 | 2.7 | 29.5 | 4.0 |
| B11615 | I82054/B07554 | 112 | 18.5 | 24.9 | 47.0 | 99.0 | 2.0 | 65.0 | 3.0 | 2.8 | 29.3 | 4.0 |
| B11583 | I82054/B07554 | 81 | 18.4 | 24.8 | 50.0 | 100.0 | 1.5 | 65.0 | 3.5 | 2.5 | 32.5 | 3.0 |
| B11516 | I82054/B07554 | 15 | 18.4 | 22.9 | 53.0 | 100.0 | 3.5 | 55.0 | 2.5 | 2.7 | 33.3 | 4.0 |
| B11522 | I82054/B07554 | 21 | 18.3 | 23.5 | 50.0 | 104.0 | 2.0 | 80.0 | 3.0 | 3.5 | 28.9 | 4.0 |
| B11613 | I82054/B07554 | 110 | 18.2 | 19.6 | 48.0 | 99.0 | 1.0 | 60.0 | 5.2 | 2.3 | 37.4 | 3.0 |
| B11614 | I82054/B07554 | 111 | 18.2 | 23.0 | 50.0 | 98.0 | 2.5 | 65.0 | 4.5 | 3.4 | 28.9 | 3.0 |
| B11623 | I82054/B07554 | 119 | 18.2 | 22.0 | 55.0 | 99.0 | 2.0 | 62.5 | 4.0 | 2.9 | 35.2 | 4.0 |
| B11612 | I82054/B07554 | 109 | 18.1 | 23.4 | 51.0 | 100.0 | 1.0 | 80.0 | 4.0 | 3.1 | 25.3 | 4.0 |
| B11501 | I82054/B07554 | 1 | 17.9 | 29.1 | 49.0 | 100.0 | 3.0 | 65.0 | 2.0 | 3.1 | 23.9 | 5.0 |
| B11577 | I82054/B07554 | 75 | 17.8 | 23.9 | 48.0 | 98.0 | 3.0 | 50.0 | 3.5 | 2.6 | 37.4 | 4.0 |
| B11561 | I82054/B07554 | 59 | 17.7 | 20.7 | 53.0 | 98.0 | 2.0 | 60.0 | 4.0 | 2.3 | 37.7 | 3.0 |
| B11554 | I82054/B07554 | 52 | 17.7 | 25.3 | 56.0 | 103.0 | 4.0 | 55.0 | 2.0 | 2.9 | 24.8 | 4.0 |
| B11622 | I82054/B07554 | 118 | 17.6 | 24.2 | 50.0 | 102.0 | 2.0 | 70.0 | 3.5 | 3.0 | 29.5 | 3.0 |
| B11598 | I82054/B07554 | 95 | 17.5 | 27.8 | 47.0 | 103.0 | 2.0 | 65.0 | 3.0 | 2.4 | 35.2 | 3.0 |
| B11507 | I82054/B07554 | 6 | 17.5 | 26.3 | 51.0 | 98.0 | 3.0 | 50.0 | 2.5 | 2.5 | 29.2 | 4.0 |
| B11514 | I82054/B07554 | 13 | 17.5 | 22.4 | 50.0 | 99.0 | 3.0 | 65.0 | 3.0 | 3.9 | 24.9 | 4.0 |
| B11624 | I82054/B07554 | 120 | 17.4 | 27.2 | 60.0 | 105.0 | 2.5 | 65.0 | 2.0 | 3.9 | 18.7 | 4.0 |
| B11591 | I82054/B07554 | 89 | 17.4 | 26.0 | 49.0 | 99.0 | 2.5 | 70.0 | 4.5 | 2.9 | 29.9 | 4.0 |
| B11559 | I82054/B07554 | 57 | 17.3 | 24.2 | 50.0 | 99.0 | 1.5 | 70.0 | 4.0 | 4.1 | 21.3 | 4.0 |
| B11510 | I82054/B07554 | 9 | 17.2 | 26.3 | 51.0 | 103.0 | 3.0 | 65.0 | 2.5 | 3.3 | 23.1 | 3.0 |
| B11560 | I82054/B07554 | 58 | 17.1 | 28.8 | 50.0 | 99.0 | 2.5 | 65.0 | 3.5 | 2.8 | 29.4 | 4.0 |
| B11586 | I82054/B07554 | 84 | 17.1 | 23.0 | 58.0 | 99.0 | 3.0 | 45.0 | 3.0 | 2.5 | 27.9 | 2.0 |
| B11558 | I82054/B07554 | 56 | 17.0 | 26.6 | 47.0 | 99.0 | 3.0 | 55.0 | 3.0 | 2.6 | 28.3 | 4.0 |
| B11625 | I82054/B07554 | 121 | 17.0 | 24.1 | 48.0 | 101.0 | 4.0 | 35.0 | 2.0 | 3.5 | 25.0 | 4.0 |
| B11619 | I82054/B07554 | 115 | 17.0 | 20.4 | 50.0 | 100.0 | 3.0 | 70.0 | 3.0 | 3.1 | 27.5 | 3.0 |
| B11520 | I82054/B07554 | 19 | 17.0 | 24.8 | 48.0 | 100.0 | 4.0 | 65.0 | 2.0 | 2.9 | 26.2 | 3.0 |
| B11551 | I82054/B07554 | 49 | 16.7 | 31.7 | 58.0 | 105.0 | 2.5 | 35.0 | 2.0 | 6.0 | 15.1 | 4.0 |
| B11572 | I82054/B07554 | 70 | 16.7 | 23.7 | 53.0 | 101.0 | 3.5 | 50.0 | 2.0 | 3.1 | 23.8 | 3.0 |
| B11580 | I82054/B07554 | 78 | 16.6 | 27.8 | 59.0 | 106.0 | 3.5 | 55.0 | 2.5 | 5.2 | 18.4 | 4.0 |
| I11272 | **PR1147-6** | 128 | 16.6 | 23.9 | 47.0 | 98.0 | 2.0 | 67.5 | 4.5 | 2.4 | 32.3 | 4.0 |
| B04554 | B00103*/X00822, **ZORRO** | 124 | 16.6 | 21.0 | 51.0 | 98.0 | 1.0 | 65.0 | 5.5 | 2.4 | 36.9 | 4.0 |
| B11525 | I82054/B07554 | 24 | 16.5 | 25.6 | 49.0 | 96.0 | 2.0 | 55.0 | 3.0 | 2.2 | 34.4 | 3.0 |

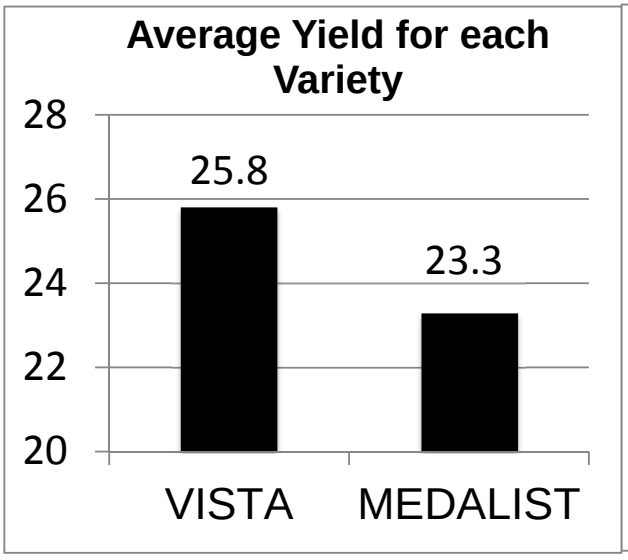
| EXPERIMENT 2425 BNF YIELD TRIAL | | | | | | | | | PLANTED: 6/19/12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | PEDIGREE | ENTRY | YIELD CWT /ACRE | 100 SEED WT. (g) | DAYS TO FLOWER | DAYS TO MATURITY | LODGING (1-5) | HEIGHT (cm) | DES. SCORE | BIOMASS | HARVEST INDEX | VIGOR (1-5) |
| B11542 | I82054/B07554 | 40 | 16.3 | 26.7 | 49.0 | 100.0 | 3.0 | 60.0 | 2.5 | 2.5 | 32.2 | 4.0 |
| B11606 | I82054/B07554 | 103 | 16.3 | 28.4 | 48.0 | 100.0 | 2.0 | 75.0 | 3.5 | 3.1 | 25.2 | 4.0 |
| B11505 | I82054/B07554 | 5 | 16.2 | 22.7 | 58.0 | 109.0 | 3.0 | 60.0 | 1.5 | 2.2 | 30.5 | 3.0 |
| B11564 | I82054/B07554 | 62 | 16.1 | 26.3 | 50.0 | 99.0 | 1.0 | 75.0 | 3.5 | 2.9 | 27.1 | 4.0 |
| B11608 | I82054/B07554 | 105 | 15.8 | 29.5 | 50.0 | 101.0 | 3.0 | 60.0 | 2.0 | 3.9 | 18.3 | 4.0 |
| B11533 | I82054/B07554 | 32 | 15.8 | 25.5 | 49.0 | 99.0 | 2.0 | 65.0 | 3.5 | 2.6 | 32.3 | 3.0 |
| B11534 | I82054/B07554 | 33 | 15.7 | 27.5 | 49.0 | 98.0 | 3.5 | 55.0 | 3.0 | 2.3 | 29.4 | 5.0 |
| B11604 | I82054/B07554 | 101 | 15.6 | 26.4 | 50.0 | 101.0 | 3.0 | 65.0 | 3.0 | 3.0 | 25.7 | 4.0 |
| B11552 | I82054/B07554 | 50 | 15.6 | 24.6 | 58.0 | 105.0 | 2.5 | 85.0 | 2.5 | 3.9 | 21.0 | 3.0 |
| B11535 | I82054/B07554 | 34 | 15.5 | 28.1 | 46.0 | 99.0 | 3.5 | 55.0 | 2.0 | 3.7 | 18.6 | 4.0 |
| B11508 | I82054/B07554 | 7 | 15.4 | 29.7 | 57.0 | 110.0 | 3.5 | 60.0 | 1.0 | 4.8 | 14.1 | 4.0 |
| B11550 | I82054/B07554 | 48 | 15.2 | 29.0 | 47.0 | 100.0 | 3.0 | 60.0 | 2.0 | 2.7 | 25.8 | 4.0 |
| B11513 | I82054/B07554 | 12 | 15.2 | 26.1 | 47.0 | 100.0 | 3.5 | 50.0 | 2.5 | 2.6 | 30.5 | 4.0 |
| B11562 | I82054/B07554 | 60 | 15.1 | 22.7 | 56.0 | 108.0 | 3.5 | 60.0 | 2.5 | 5.3 | 10.9 | 3.0 |
| B11600 | I82054/B07554 | 97 | 15.0 | 27.4 | 50.0 | 101.0 | 2.0 | 75.0 | 3.5 | 3.6 | 19.1 | 3.0 |
| B11504 | I82054/B07554 | 4 | 15.0 | 25.4 | 49.0 | 102.0 | 3.0 | 55.0 | 3.0 | 3.7 | 18.5 | 4.0 |
| B11587 | I82054/B07554 | 85 | 14.8 | 26.8 | 52.0 | 98.0 | 1.5 | 70.0 | 3.0 | 2.6 | 32.5 | 4.0 |
| B11626 | I82054/B07554 | 122 | 14.8 | 27.0 | 49.0 | 100.0 | 3.5 | 60.0 | 2.0 | 5.3 | 12.5 | 4.0 |
| B11502 | I82054/B07554 | 2 | 14.8 | 26.0 | 49.0 | 99.0 | 3.0 | 45.0 | 2.5 | 2.9 | 25.8 | 3.0 |
| B11512 | I82054/B07554 | 11 | 14.5 | 22.5 | 54.0 | 103.0 | 3.0 | 60.0 | 2.0 | 2.8 | 26.9 | 3.0 |
| B11503 | I82054/B07554 | 3 | 14.4 | 23.2 | 59.0 | 108.0 | 3.5 | 70.0 | 2.0 | 5.6 | 13.3 | 3.0 |
| B11573 | I82054/B07554 | 71 | 14.1 | 21.2 | 53.0 | 103.0 | 2.5 | 55.0 | 1.5 | 2.9 | 25.6 | 4.0 |
| B11537 | I82054/B07554 | 36 | 14.0 | 25.9 | 58.0 | 110.0 | 3.5 | 40.0 | 1.5 | 4.7 | 12.3 | 4.0 |
| B11575 | I82054/B07554 | 73 | 14.0 | 24.5 | 49.0 | 102.0 | 2.5 | 75.0 | 2.5 | 2.4 | 30.1 | 3.0 |
| B11540 | I82054/B07554 | 38 | 13.8 | 28.6 | 48.0 | 97.0 | 3.0 | 65.0 | 3.0 | 3.7 | 18.9 | 5.0 |
| B11515 | I82054/B07554 | 14 | 13.7 | 27.0 | 58.0 | 108.0 | 3.0 | 65.0 | 2.5 | 5.5 | 17.3 | 4.0 |
| B11518 | I82054/B07554 | 17 | 13.7 | 29.5 | 49.0 | 101.0 | 3.0 | 45.0 | 2.0 | 3.0 | 19.6 | 3.0 |
| I82054 | **PUEBLA 152 MX** | 123 | 13.6 | 27.8 | 57.0 | 109.0 | 4.0 | 40.0 | 2.0 | 4.7 | 9.4 | 5.0 |
| B11521 | I82054/B07554 | 20 | 13.4 | 23.2 | 58.0 | 110.0 | 4.0 | 40.0 | 1.0 | 4.3 | 12.9 | 3.0 |
| B11576 | I82054/B07554 | 74 | 13.2 | 22.3 | 51.0 | 95.0 | 1.5 | 45.0 | 1.5 | 1.3 | 38.6 | 3.0 |
| B11579 | I82054/B07554 | 77 | 13.1 | 22.9 | 47.0 | 102.0 | 2.0 | 65.0 | 3.5 | 1.3 | 43.4 | 3.0 |
| B11548 | I82054/B07554 | 46 | 12.9 | 23.9 | 56.0 | 106.0 | 2.0 | 65.0 | 3.0 | 3.1 | 18.8 | 3.0 |
| B11528 | I82054/B07554 | 27 | 12.8 | 23.7 | 46.0 | 96.0 | 3.0 | 60.0 | 2.5 | 2.2 | 30.8 | 4.0 |
| B11517 | I82054/B07554 | 16 | 12.5 | 30.2 | 51.0 | 104.0 | 3.5 | 55.0 | 2.0 | 4.2 | 15.2 | 5.0 |
| B11529 | I82054/B07554 | 28 | 12.5 | 26.3 | 58.0 | 106.0 | 2.0 | 45.0 | 1.5 | 3.4 | 17.0 | 2.0 |
| B11578 | I82054/B07554 | 76 | 12.1 | 32.2 | 48.0 | 105.0 | 2.5 | 60.0 | 3.0 | 4.5 | 12.7 | 4.0 |
| B11585 | I82054/B07554 | 83 | 10.0 | 17.0 | 46.0 | 95.0 | 1.0 | 46.6 | 2.2 | 1.2 | 35.6 | 3.0 |
| B11605 | I82054/B07554 | 102 | 9.2 | 24.1 | 59.0 | 109.0 | 3.0 | 70.0 | 2.0 | 4.2 | 9.1 | 3.0 |
| B11599 | I82054/B07554 | 96 | 9.0 | 25.0 | 54.0 | 110.0 | 2.5 | 80.0 | 2.0 | 6.2 | 13.9 | 4.0 |
| B11524 | I82054/B07554 | 23 | 8.6 | 22.8 | 0.0 | 111.0 | 3.5 | 55.0 | 1.5 | 8.4 | 5.5 | 4.0 |
| B11541 | I82054/B07554 | 39 | 3.5 | 28.7 | 52.0 | 109.0 | 4.0 | 35.0 | 1.5 | 5.8 | 6.3 | 4.0 |
| MEAN (130) | | | 17.9 | 24.7 | 50.7 | 100.7 | 2.4 | 61.9 | 3.1 | 3.4 | 27.7 | 3.6 |
| LSD (0.05) | | | 4.2 | 1.7 | 3.7 | 9.9 | 1.0 | 17.2 | 1.3 | 1.4 | 6.9 | 0.9 |
| CV (%) | | | 17.5 | 5.0 | 4.4 | 5.9 | 24.7 | 16.8 | 24.9 | 30.8 | 18.4 | 18.5 |

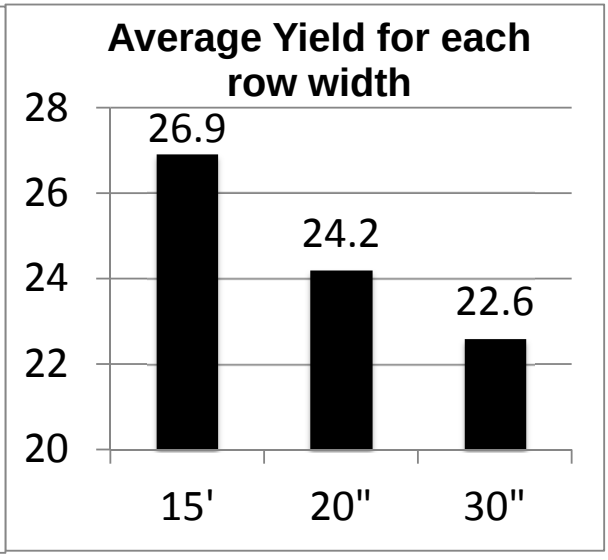
**Navy Row Width**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| 15 | Vista | 28.8 | 21.5 | 132,456 |
| 15 | Medalist | 24.9 | 22.3 | 128,324 |
| 20 | Vista | 25.4 | 22.1 | 118,456 |
| 20 | Medalist | 22.9 | 22.5 | 116,978 |
| 30 | Vista | 23.1 | 23.5 | 105,279 |
| 30 | Medalist | 22.0 | 23.5 | 104,238 |

LSD=2.17
C.V.= 5.9%

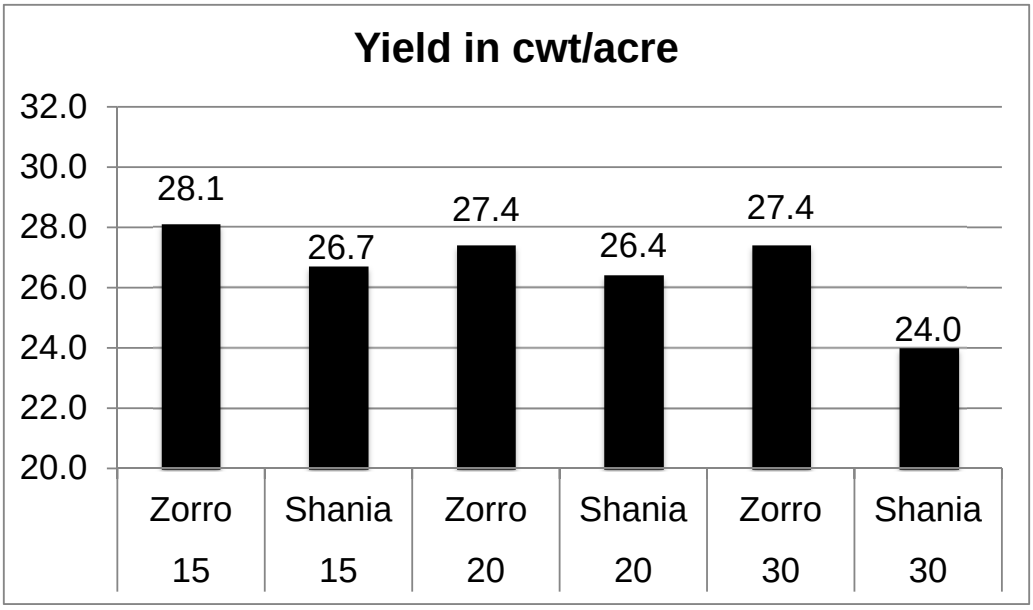


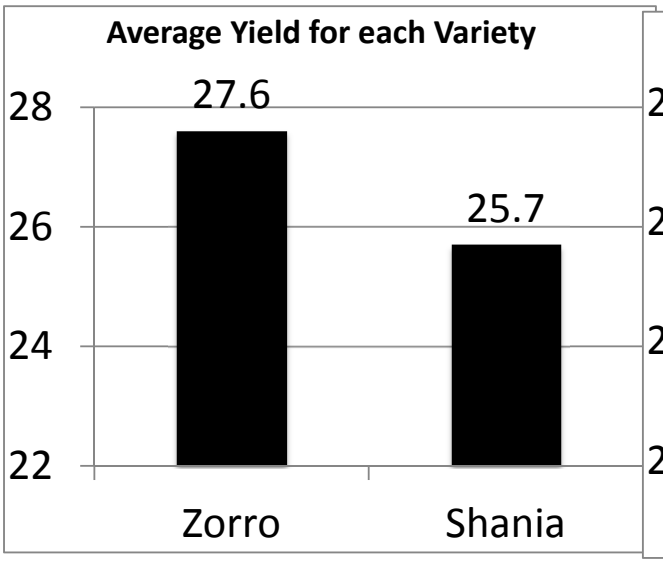



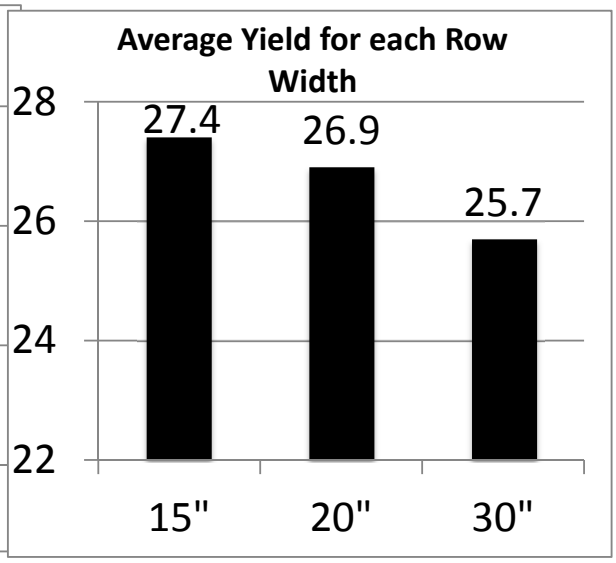



**Black Row Width**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| 15 | Zorro | 28.1 | 21.1 | 126,876 |
| 15 | Shania | 26.7 | 21.2 | 128,432 |
| 20 | Zorro | 27.4 | 21.8 | 118,632 |
| 20 | Shania | 26.4 | 21.9 | 116,479 |
| 30 | Zorro | 27.4 | 22.1 | 105,387 |
| 30 | Shania | 24.0 | 22.3 | 106,368 |
| | | LSD=3.01 | | |
| | | C.V.=7.5% | | |

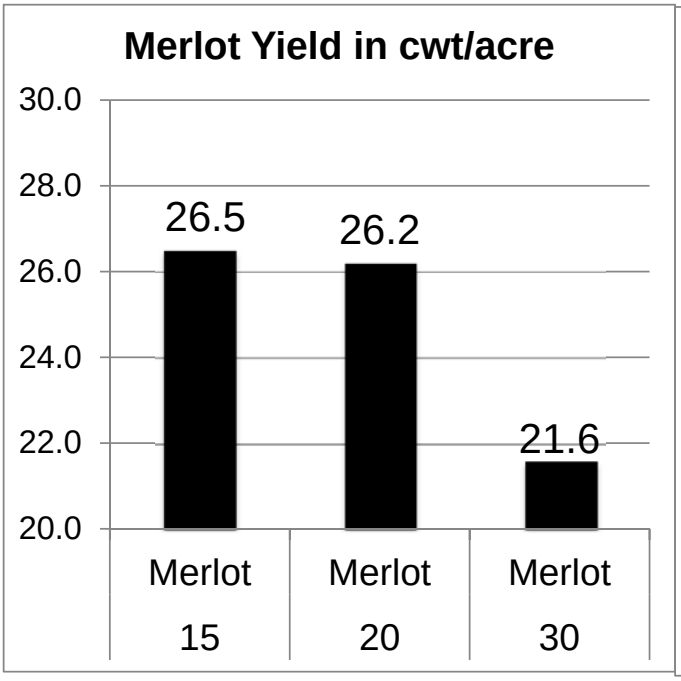


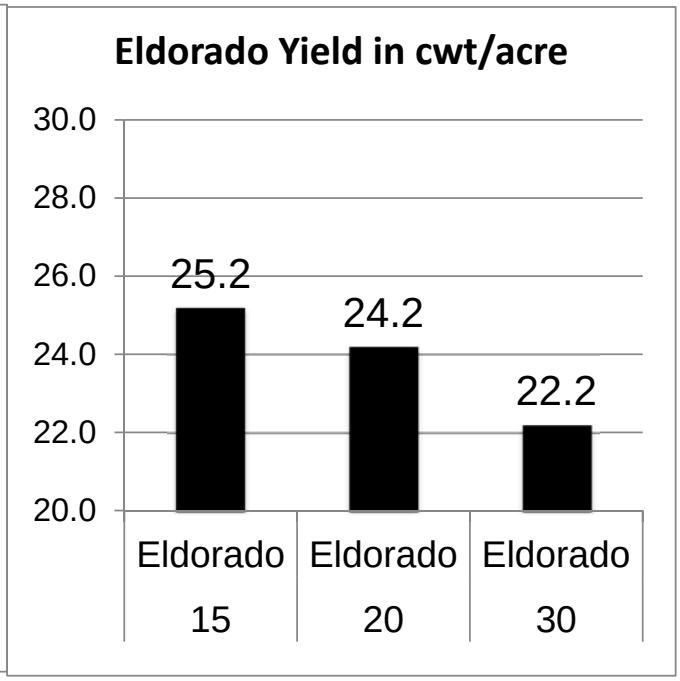



**Small Red Row Width**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| 15 | Merlot | 26.5 | 24.7 | 108,782 |
| 20 | Merlot | 26.2 | 25.6 | 102,654 |
| 30 | Merlot | 21.6 | 26.2 | 92,345 |
| | | LSD=3.36 | | |
| | | C.V.=7.8% | | |



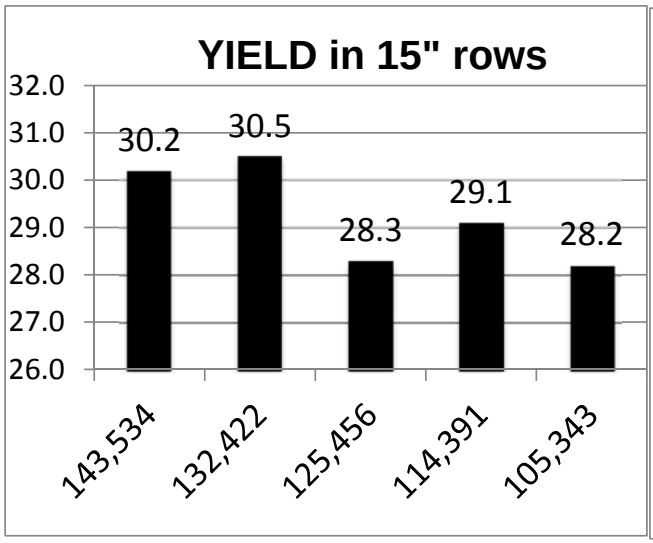



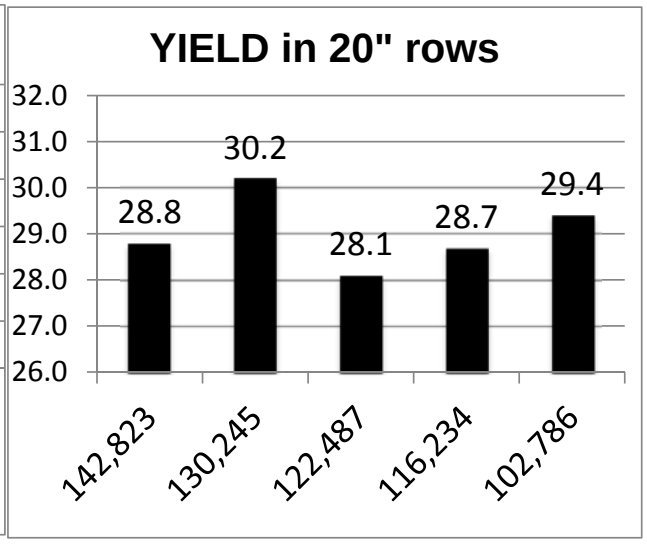

**Pinto Row Width**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

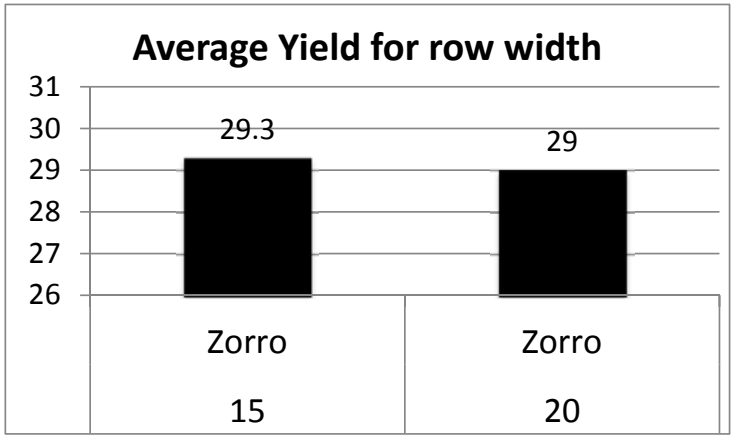
| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| **15** | **Eldorado** | **25.2** | **24.8** | **117,322** |
| **20** | **Eldorado** | **24.2** | **25.4** | **101,930** |
| **30** | **Eldorado** | **22.2** | **26.6** | **84,215** |
| | | **LSD=3.79** | | |
| | | **C.V.=9.2%** | | |

**Black Row Width/Population**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| 15 | Zorro | 30.2 | 21.9 | 143,534 |
| 15 | Zorro | 30.5 | 22.1 | 132,422 |
| 15 | Zorro | 28.3 | 20.2 | 125,456 |
| 15 | Zorro | 29.1 | 21.4 | 114,391 |
| 15 | Zorro | 28.2 | 21.5 | 105,343 |
| 20 | Zorro | 28.8 | 22.3 | 142,823 |
| 20 | Zorro | 30.2 | 20.8 | 130,245 |
| 20 | Zorro | 28.1 | 21.7 | 122,487 |
| 20 | Zorro | 28.7 | 22.1 | 116,234 |
| 20 | Zorro | 29.4 | 22.4 | 102,786 |
| | | LSD=1.44 | | |
| | | C.V.=3.4% | | |

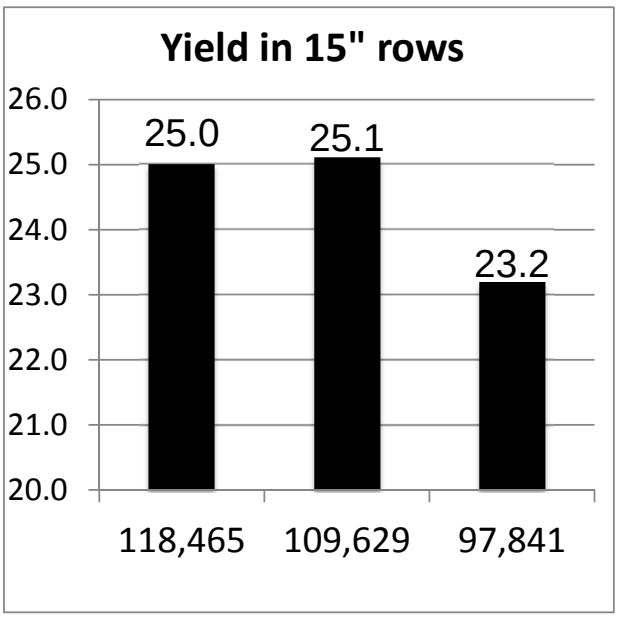


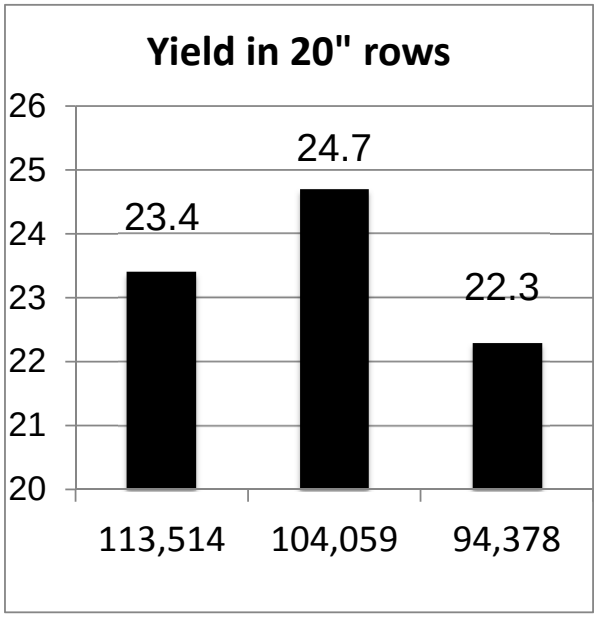



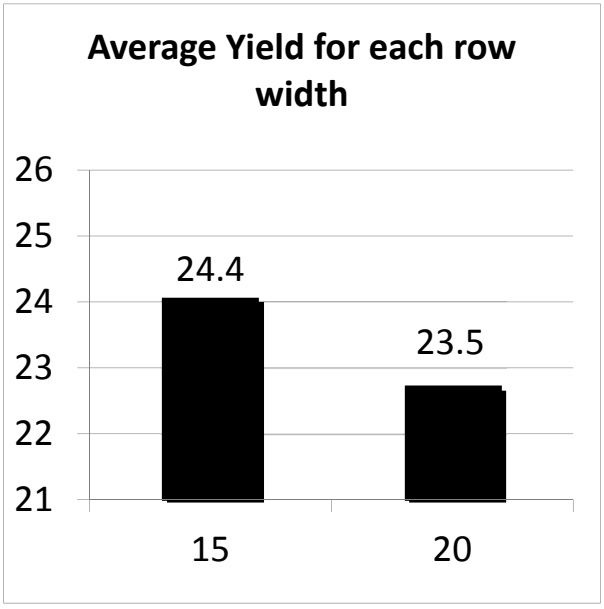



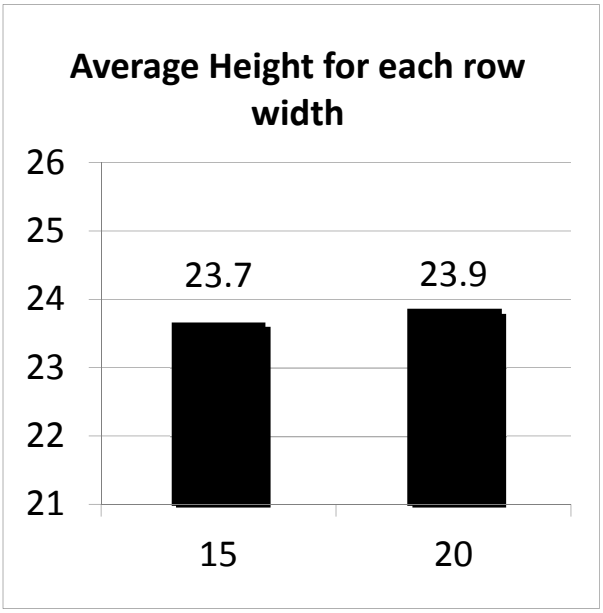
**Small Red Row Width/Population**
**MSU Saginaw Valley Research and Extension Center**
**Frankenmuth, MI**

| Row width | Variety | Yield | Height | Population |
|---|---|---|---|---|
| 15 | Merlot | 25.0 | 23.6 | 118,465 |
| 15 | Merlot | 25.1 | 23.9 | 109,629 |
| 15 | Merlot | 23.2 | 23.5 | 97,841 |
| 20 | Merlot | 23.4 | 23.6 | 113,514 |
| 20 | Merlot | 24.7 | 24.2 | 104,059 |
| 20 | Merlot | 22.3 | 23.8 | 94,378 |
| | | LSD=3.60 | | |
| | | C.V.=10% | | |



## 2012 White Mold Fungicide Trial

Montcalm Research Farm, Entrican, Michigan

Merlot Small Red

| Treatment | Rate | Application Code | Incidence %infection | Severity %severity | YIELD |
|---|---|---|---|---|---|
| UTC | | | 63 | 48 | 1924 |
| Endura | 8 oz | AB | 43 | 29 | 2291 |
| Omega | 8 oz | AB | 40 | 27 | 2350 |
| PROPULSE+INDUCE | 8 oz | A | 44 | 31 | 2362 |
| PROPULSE+INDUCE | 10 oz | A | 43 | 29 | 2410 |
| PROPULSE+INDUCE | 8 oz | AB | 45 | 32 | 2413 |
| PROPULSE+INDUCE | 10 oz | AB | 36 | 24 | 2544 |
| PROLINE+INDUCE | 5.7 oz | AB | 40 | 28 | 2280 |
| APPROACH+INDUCE | 9 oz | A | 50 | 37 | 2402 |
| APPROACH+INDUCE | 9 oz | AB | 36 | 24 | 2213 |
| | | | | LSD@.05 | 394 |
| | | | | C.V. Value | 11.7% |

Application Code:A=100% or first bloom, B=7 days after 100% bloom

Rating - % infection "rating" on September 26, % Incidence, %severity

Merlot Small Red Beans planted in 20" rows. Irrigation of two .5 inch per week

Planted:June 14 Harvested: September 28

First Spray: July 28 Second Spray: August 6

Sprayed with 4 row bicycle-wheel CO2 sprayer using 30 gpa at 65 psi.

Twin-Jet nozzle placed directly over the row.

Plot size sprayed was 4 Rows by 30 feet.

Harvest area was middle 2 Rows by 15 feet.

## Volmering Family Farms-Cooperative Elevator-Ruth Merlot Small Red

| Treatment | Rate | Application Code | Incidence %infection | Severity %severity | YIELD |
|---|---|---|---|---|---|
| UTC | | | 26 | 13 | 3162 |
| Endura | 8 oz | AB | 21 | 8 | 3587 |
| Omega | 8 oz | AB | 23 | 7 | 3488 |
| PROPULSE+INDUCE | 8 oz | A | 23 | 7 | 3465 |
| PROPULSE+INDUCE | 10 oz | A | 29 | 12 | 3394 |
| PROPULSE+INDUCE | 8 oz | AB | 21 | 8 | 3763 |
| PROPULSE+INDUCE | 10 oz | AB | 26 | 11.5 | 3536 |
| PROLINE+INDUCE | 5.7 oz | AB | 21 | 10 | 3124 |
| | | | | LSD@.05 | 331 |
| | | | | C.V. Value | 6.6% |

Planted: May 30 Harvested: September 13

First Spray: July 23 Second Spray: July 30

22" inch Rows

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

# Herbicide-resistant weed management strategies in Roundup Ready sugarbeet

Christy Sprague and Gary Powell, Michigan State University

| | |
|---|---|
| **Location:** Saginaw Valley Research and Extension Center | **Tillage:** Conventional |
| **Planting Date:** April 4, 2012 | **Herbicides:** see treatments |
| **Soil Type:** Clay loam; 2.2 OM; pH 7.8 | **Varieties:** HM-173RR |
| **Replicated:** 4 times | **Population:** 48,000 seeds/A |

*Table 1.* Sugarbeet injury, weed control, sugarbeet yield and recoverable white sugar per acre (RWSA) for various herbicide programs.

| | | WEED CONTROL (at Harvest) | | | SUGARBEET | |
|---|---|---|---|---|---|---|
| Herbicide treatments [a] | Injury[b] | Common lambsquarters | Redroot pigweed | Common ragweed | Yield | RWSA |
| | —%— | —— % control —— | | | - ton/A - | — lb/A — |
| Roundup (22 oz) - applied 2X | 0 | 96 | 99 | 94 | 23.3 | 5494 |
| Roundup (33 oz) - applied 2X | 0 | 98 | 99 | 95 | 23.4 | 5522 |
| Nortron (PRE) fb. Roundup (33 oz) | 10 | 93 | 99 | 93 | 23.3 | 5198 |
| Roundup + Betamix (2 pt) fb. Roundup | 9 | 88 | 99 | 92 | 22.5 | 5118 |
| Roundup + Betamix (3 pt) fb. Roundup | 8 | 94 | 98 | 95 | 24.6 | 6010 |
| Roundup + Stinger fb. Roundup | 15 | 90 | 96 | 95 | 22.7 | 5250 |
| Roundup fb. Stinger + Roundup | 0 | 96 | 98 | 99 | 22.9 | 5557 |
| Roundup fb. Outlook + Roundup | 0 | 96 | 99 | 96 | 22.4 | 5250 |
| Roundup fb. Warrant + Roundup | 0 | 92 | 99 | 93 | 21.7 | 4994 |
| Roundup fb. Dual Magnum + Roundup | 0 | 95 | 99 | 91 | 23.6 | 5427 |
| **$LSD_{0.05}$**[c] | 4 | 6 | 2 | 7 | n.s. | 809 |

[a] POST herbicides were applied when sugarbeet were at the 2- and 6-leaf stages, except for the POST Roundup application after Nortron PRE was applied to 4-leaf sugarbeet. In not otherwise indicated, Roundup PowerMax was applied at 22 fl oz/A and all POST herbicide treatments included ammonium sulfate at 17 lb/100 gal. See recommendations in the MSU Weed Control Guide for Field Crops.

[b] Injury was evaluated May 22 (7 d after the 2-leaf application timing)

[c] Means within a column greater than least significant difference (LSD) value are different from each other.

**Summary:** This trial was conducted to compare various weed control systems using potential tank-mixture partners with glyphosate. Above is a subset of the treatments examined in this trial. Early in the season there was significant sugarbeet injury from PRE applications of Nortron or with treatments that included Betamix or Stinger in the first POST application. If Stinger, Outlook, Dual Magnum or Warrant were added to the 2nd POST application there was very little injury (data not shown). Sugarbeet were able to completely recover from initial injury by May 30. There initially were some differences in weed control between the herbicide treatments; however by harvest overall weed control was good. Sugarbeet yield of the untreated control was 3.1 tons/A and there was only 715 RWSA produced. This was an 87% and 88% reduction in yield and RWSA, respectively, compared with the highest yielding treatment in this trial. Overall there was no difference in yield between the different treatments, but there were some differences in RWSA. In general, there was not a significant advantage to applying a higher rate (33 fl oz/A) of glyphosate for weed control or yield by the end of the season. For the different tank-mixtures, including other products once sugarbeet was past the two-leaf stage generally had little effect on yield. However in the future, different tank-mix partners may need to be included in earlier applications depending on different herbicide-resistant weed situations. Tank-mixture combinations with the 2nd glyphosate application may help reduce the risk of the development of herbicide-resistant weeds.

# Tolerance of replanted sugarbeet to Warrant

Christy Sprague and Gary Powell, Michigan State University

| | |
|---|---|
| **Location:** Saginaw Valley Research and Extension Center | **Tillage:** Conventional |
| **Planting Dates:** see treatments | **Herbicide Application Date:** April 4, 2012 |
| **Soil Type:** Clay loam; 2.2 OM; pH 7.8 | **Varieties:** Hilleshog 9042 RR |
| **Replicated:** 4 times | **Population:** 48,000 seeds/A |

*Table 1.* Main effect of herbicide for sugarbeet planted in to herbicide residues at various weeks after application. Stand counts were taken 6 wks after planting and at harvest, yield, and recoverable white sugar per acre (RWSA) are also presented.

| MAIN EFFECT[a] | STAND (6 WAT) | STAND (FINAL) | YIELD | RWSA |
|---|---|---|---|---|
| HERBICIDE[b] | — plants/100 ft — | — plants/100 ft — | —— ton/A —— | —— lb/A —— |
| No herbicide | 99 A[c] | 93 A | 16.1 B | 3427 B |
| Warrant 3 pt | 77 B | 72 B | 15.7 B | 3212 B |
| Warrant 6 pt | 73 B | 74 B | 16.5 B | 3406 B |
| Dual Magnum | 92 A | 87 A | 19.0 A | 4044 A |

[a] Main effect of herbicide are averaged over planting dates; sugarbeet were planted weekly for 7 weeks, including the day of application.
[b] Herbicides were applied on April 4 into a weed-free seed bed; the application rate of Dual Magnum was 1.33 pt/A.
[c] Means within a column with different letters are significantly different from each other.

*Table 2.* Main effect of planting date for sugarbeet planted in to herbicide residues at various weeks after application. Stand counts were taken 6 wks after planting and at harvest, yield, and recoverable white sugar per acre (RWSA) are also presented.

| MAIN EFFECT[a] | STAND (6 WAT) | STAND (FINAL) | YIELD | RWSA |
|---|---|---|---|---|
| PLANTING DATE[b] | — plants/100 ft — | — plants/100 ft — | —— ton/A —— | —— lb/A —— |
| Week-0 | 112 B[c] | 112 B | 23.1 A | 4912 A |
| Week-1 | 128 A | 126 A | 21.3 A | 5299 A |
| Week-2 | 97 C | 92 C | 18.4 B | 3765 B |
| Week-3 | 78 D | 71 D | 17.5 B | 3505 BC |
| Week-4 | 50 F | 43 E | 11.7 D | 2130 D |
| Week-5 | 71 DE | 70 D | 15.0 C | 3022 C |
| Week-6 | 60 EF | 57 E | 10.8 D | 2024 D |

[a] Main effect of planting dates are averaged over herbicides; herbicides were applied on April 4 into a weed-free seed bed; the application rate of Dual Magnum was 1.33 pt/A.
[b] Sugarbeet were planted weekly for 7 weeks, including the day of application.
[c] Means within a column with different letters are significantly different from each other.

**Summary:** Warrant is a new encapsulated acetochlor product that is being examined as a potential tank-mix partner with glyphosate in Roundup Ready sugarbeet. Preemergence applications of Warrant have been shown to cause significant sugarbeet injury and in some cases reductions in yield. If sugarbeet needs to be replanted after a lay-by application of Warrant sugarbeet injury, reductions in stand, and potential reductions of yield may be a concern. This study was conducted to determine the time interval needed between Warrant applications and replanting sugarbeet. Four different treatments a no herbicide control, Warrant at 1X (3 pt) and 2X (6 pt) the suggested labeled rate, and Dual Magnum a similar herbicide to Warrant currently labeled for use in sugarbeet were examined. In 2011, if sugarbeet were planted into the 1X rate of Warrant or Dual Magnum prior to the 4 week after application planting, sugarbeet stand was significantly lower than the no herbicide treatment. For the 2X Warrant application rate sugarbeet stand was lower until the 5 week planting. In 2012, sugarbeet stand averaged over all planting dates was reduced by Warrant (1X and 2X). But these applications did not affect yield or RWSA compared to the no herbicide control. Averaged over all herbicide applications, planting date significantly affected sugarbeet stand, yield, and RWSA. This year due to the drier weather conditions there was not a planting date by herbicide application interaction, and replanting sugarbeet into Warrant residues did not significantly reduce yield or RWSA compared with the no herbicide control. However, under conditions with more moisture this may be more apparent similar to the 2011 results.

# Volunteer corn effects on Roundup Ready sugarbeet yield and quality planted in wide- and narrow-rows

Amanda Harden and Christy Sprague, Michigan State University

| | | | |
|---|---|---|---|
| **Location:** | East Lansing/SVREC (Richville) | **Row widths:** | 30- & 15-inches |
| **Planting Dates:** | April 12 (EL); April 4 (SVREC) | **Volunteer corn:** | 'F2' DeKalb 46-61 "SmartStax" |
| **Soil Type:** | Loam, 2.8 OM, pH 6.6 (EL)<br>Clay Loam, 2.2 OM, pH 7.8 (SVEC) | **Tillage:** | Conventional |
| **Herbicides:** | Roundup PowerMax (22 fl oz/A) + AMS | **Population:** | 52,000 seeds/A |
| **Variety:** | HM-173RR, Roundup Ready | **Replicated:** | 4 times |

*Table 1.* Main effect of row width on sugarbeet yield and recoverable white sugar per acre (RWSA) averaged over volunteer corn populations.

| | EAST LANSING | | SVREC | |
|---|---|---|---|---|
| **ROW WIDTH** | Yield | RWSA | Yield | RWSA |
| | –tons/A– | –lbs/A– | –tons/A– | –lbs/A– |
| Wide (30-inches) | 19.2 B[a] | 5442 B | 27.9 A | 6759 B |
| Narrow (15-inches) | 21.7 A | 6379 A | 28.5 A | 7371 A |

[a] Means within a column with different letters are significantly different from each other

*Table 2.* Main effect of volunteer corn population on sugarbeet yield and recoverable white sugar per acre (RWSA) averaged over row widths.

| | EAST LANSING | | SVREC | |
|---|---|---|---|---|
| **VOUNTEER CORN POPULATION** | Yield | RWSA | Yield | RWSA |
| —— plants/150 ft$^2$ —— | –tons/A– | –lbs/A– | –tons/A– | –lbs/A– |
| 0 | 22.7 A[a] | 6389 A | 30.1 A | 7432 A |
| 3 | 22.5 A | 6439 A | 29.7 A | 7457 A |
| 6 | 19.8 B | 5845 AB | 30.3 A | 7474 A |
| 12 | 21.3 AB | 6138 AB | 29.2 A | 7533 A |
| 24 | 19.6 B | 5687 B | 25.1 B | 6222 B |
| 48 | 16.8 C | 4964 C | 25.0 B | 6276 B |

[a] Means within a column with different letters are significantly different from each other

**Summary:** This trial was conducted to determine the impact of volunteer glyphosate-resistant corn on sugarbeet yield and quality in sugarbeet planted in wide and narrow rows. Various volunteer corn populations were planted the same day as sugarbeet with 'F2' corn seed harvested the previous year. All plots were maintained weed-free with applications of glyphosate. Although not presented, sugarbeet canopy closure was quicker in narrow rows at the SVREC location. Overall at both locations RWSA was higher in sugarbeet planted in narrow rows. This was also reflected in sugarbeet yield at East Lansing. Volunteer corn affected sugarbeet yield similarly between wide- and narrow-rows. At East Lansing, volunteer corn populations of 6 plants per 150 ft$^2$ significantly reduced yield and at SVREC volunteer corn populations of 24 plants per 150 ft$^2$ reduced yield. Differences in results between the two locations were most likely due to differences in corn growth and biomass. Extremely dry conditions early followed by better moisture later at SVREC resulted in better sugarbeet competition with volunteer corn. However, overall volunteer corn populations can have a significant effect on sugarbeet yield and quality and need to be managed as a significant weed problem.

# Control of volunteer Roundup Ready corn in Roundup Ready sugarbeet

Amanda Harden and Christy Sprague, Michigan State University

| | | | |
|---|---|---|---|
| **Location:** | East Lansing/SVREC (Richville) | **Variety:** | HM-173RR, Roundup Ready |
| **Planting Dates:** | April 12 (EL); April 4 (SVREC) | **Volunteer corn:** | 'F2' DeKalb 46-61 "SmartStax" |
| **Soil Type:** | Loam, 2.8 OM, pH 6.6 (EL)<br>Clay Loam, 2.2 OM, pH 7.8 (SVEC) | **Tillage:** | Conventional |
| **Replicated:** | 4 times | **Population:** | 52,000 seeds/A; 30-inch rows |

*Table 1.* Effect of application timing on volunteer corn control and sugarbeet yield and quality at SVREC.

| Removal Timing[a] | DAP[b] | Volunteer corn | | Sugarbeet | |
|---|---|---|---|---|---|
| | | Control[c] | Final biomass | Yield | RWSA |
| | | —— % —— | —— g/A —— | —— tons/A —— | —— lbs/A —— |
| No corn | 0 | -- | 0 B | 28.8 A | 7399 A |
| V2 | 42 | 99 A[d] | 5.9 B | 31.8 A | 7941 A |
| V3-V4 | 53 | 98 A | 2.9 B | 29.0 A | 6917 A |
| V5-V6 | 62 | 95 B | 60 B | 29.4 A | 7205 A |
| V6-V7 | 69 | 82 C | 101 B | 28.9 A | 6860 A |
| V7 | 77 | 76 D | 111 B | 31.2 A | 7529 A |
| Untreated | -- | 0 E | 1287 A | 28.9 A | 6930 A |

[a] Weeds were controlled at these volunteer corn stages using SelectMax or Assure II + Roundup PowerMax (22 fl oz/A) + AMS (17 lb/100 gal). There were no differences between the different herbicide treatments so results were combined.
[b] Days after planting, application time.
[c] Control was evaluated ~16 days after the last application timing.
[d] Means within a column with different letters are significantly different from each other.

*Table 2.* Effect of application timing on volunteer corn control and sugarbeet yield and quality at East Lansing.

| Removal Timing[a] | DAP[b] | Volunteer corn | | Sugarbeet | |
|---|---|---|---|---|---|
| | | Control[c] | Final biomass | Yield | RWSA |
| | | —— % —— | —— g/A —— | —— tons/A —— | —— lbs/A —— |
| No corn | 0 | -- | 0 B | 21.4 B | 5670 B |
| V2 | 49 | 99 A[d] | 0 B | 21.9 B | 5779 B |
| V4 | 63 | 98 A | 23 B | 22.6 AB | 6103 AB |
| V6 | 68 | 98 A | 17 B | 24.5 A | 6688 A |
| V10 | 79 | 91 B | 162 B | 20.8 B | 5557 B |
| V10 | 86 | 73 C | 408 B | 21.6 AB | 5999 B |
| Untreated | -- | 0 D | 2971 A | 15.3 C | 4162 C |

[a] Weeds were controlled at these volunteer corn stages using SelectMax or Assure II + Roundup PowerMax (22 fl oz/A) + AMS (17 lb/100 gal). There were no differences between the different herbicide treatments so results were combined.
[b] Days after planting, application time.
[c] Control was evaluated ~16 days after the last application timing.
[d] Means within a column with different letters are significantly different from each other.

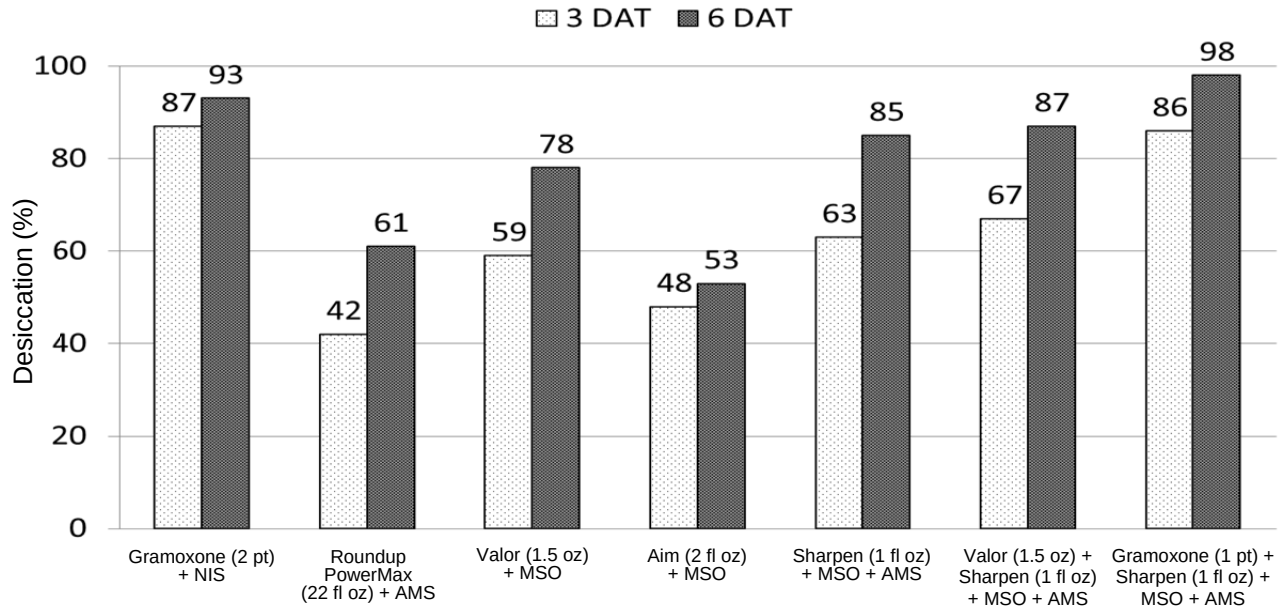
**Summary:** This trial was conducted to determine the impact of different volunteer corn control timings with Assure II and SelectMax on volunteer corn control, sugarbeet yield and recoverable white sugar per acre. Volunteer corn was planted at 12 plants per 150 $ft^2$. Volunteer corn was controlled at various stages with either Assure II or SelectMax. Results were similar between the two herbicides and therefore are combined. Volunteer corn control was lower for the later application timings by mid-season. However, by harvest volunteer corn control was similar between timings and volunteer corn biomass was significantly reduced. Differences in sugarbeet yield and RWSA did not occur at SVREC, probably due to poor volunteer corn growth. However, at East Lansing there were differences in yield with an overall yield reduction of 30% if volunteer corn was not controlled. Due to overall dry conditions this year there were very few differences in the time for volunteer corn removal. This research will be repeated in 2013.

# Evaluation of preharvest desiccants in dry edible beans (Saginaw Valley Research and Extension Center – 2012)

Christy Sprague and Gary Powell, Michigan State University

| | |
|---|---|
| **Location:** Richville (SVREC) | **Tillage:** Conventional |
| **Planting Date:** June 13, 2012 | **Variety:** 'Zorro' black beans |
| **Preharvest Application Date:** Sept. 5, 2012 | **Row width:** 20-inch |
| **Soil Type:** Clay loam | **Replicated:** 4 times |

*Figure 1.* Preharvest treatment effects on dry bean desiccation 3 and 6 days after treatment (DAT).




**Summary:** This study was conducted to examine various preharvest treatments for dry edible bean desiccation. At the 3 DAT evaluation, Gramoxone alone and tank-mixed with Sharpen provided significantly higher ($p \leq 0.05$) dry bean desiccation than any of the other treatments. This was in contrast to results from 2011 where Valor (1.5 oz/A) + MSO and Sharpen (1 fl oz/A) + MSO + AMS provided the greatest desiccation at this timing. By 6 DAT, the Gramoxone treatments still provided the greatest dry bean desiccation (>90%), however Valor, Sharpen and the combination of the two provided greater than 75% dry bean desiccation. All of these treatments provided greater than 90% desiccation in 2011. Differences in moisture and temperature between the two years at the time of desiccation may help explain the differences in the speed of desiccation between the two years. This year conditions were cooler and wetter at the time of desiccation. By 14 DAT all treatments with the exception of Aim (2 fl oz) + MSO provided 99% dry bean desiccation. From these results and from those of previous years there are several effective desiccation products. However, each of these products has specific precautions and limitations that need to be considered. Information on these restrictions and how to best use these products can be found in Chapter 5 of the 2013 MSU Weed Control Guide for Field Crops (E-434). This research was supported by various companies and Michigan Dry Bean Commission funding from the Michigan Department of Agriculture Specialty Crops grant.