



**COLORADO STATE UNIVERSITY**

# **Agricultural Experiment Station**

College of Agricultural Sciences - Department of Soil & Crop Sciences -  
Extension

**2025**



# **DRY EDIBLE BEAN PERFORMANCE TRIALS**

## **Making Better Decisions**



**CROPS TESTING**  
PROGRAM

# Table of Contents

|   |    |
|---|----|
| Authors.....  | 3  |
| 2025 Colorado Black-Eyed Pea, Pinto, Black, and Mayocoba Bean Performance Trials.....         | 4  |
| 2025 Irrigated Pinto Bean Variety Performance Trial at Yuma.....                              | 6  |
| 2025 Irrigated Black Bean Variety Performance Trial at Yuma.....                              | 7  |
| 2025 Irrigated Yellow Bean Variety Performance Trial at Yuma.....                             | 8  |
| 2025 Irrigated Dry Bean Variety Performance Trial at Rocky Ford.....                          | 9  |
| 2025 Dryland Black-Eyed Pea Variety Performance Trial at Akron.....                           | 10 |
| 2025 Irrigated Black-Eyed Pea Variety Performance Trial at Akron.....                         | 11 |
| Dryland Black-Eyed Pea Multi-Year (2020-2025) Variety Performance Trial Results at Akron..... | 12 |
| Irrigated Black-Eyed Pea Multi-Year (2023-2025) Variety Performance .....                     | 13 |
| Bean Bread: A Market Opportunity for Black-Eyed Peas?.....                                    | 14 |
| Nitrogen and Inoculant Management for Black-Eyed Pea in Colorado Sustainable Agriculture..... | 17 |

For the fastest access to up-to-date variety information and results visit us at:  
[www.csucrops.org](http://www.csucrops.org)

Disclaimer: Mention of a trademark proprietary product does not constitute endorsement by the Colorado Agricultural Experiment Station.

Colorado State University is an equal opportunity/affirmative action institution and complies with all Federal and Colorado State laws, regulations, and executive orders regarding affirmative action requirements in all programs. The Office of Equal Opportunity is located in 101 Student Services. In order to assist Colorado State University in meeting its affirmative action responsibilities, ethnic minorities, women, and other protected class members are encouraged to apply and to so identify themselves.

## Authors

Sally Jones-Diamond, Director, Crops Testing Program, Colorado State University, Dept. of Soil and Crop Sciences, Phone: 970-214-4611, E-mail: [sally.jones@colostate.edu](mailto:sally.jones@colostate.edu)

Jason Webb, Co-Director, Crops Testing Program, Colorado State University, Dept. of Soil and Crop Sciences, Phone: 970-520-1359, E-mail: [jason.webb@colostate.edu](mailto:jason.webb@colostate.edu)

Jeff Davidson, Research Lead, CSU Arkansas Valley Research Center, Phone: 719-254-6312, E-mail: [jeffery.davidson@colostate.edu](mailto:jeffery.davidson@colostate.edu)

Kevin Tanabe, Farm Manager, CSU Arkansas Valley Research Center, Phone: 719-254-6312, E-mail: [kevin.tanabe@colostate.edu](mailto:kevin.tanabe@colostate.edu)

Ed Asfeld, Research Associate, Crops Testing Program, Colorado State University, Dept. of Soil and Crop Sciences, Phone: 970-554-0980, E-mail: [ed.asfeld@colostate.edu](mailto:ed.asfeld@colostate.edu)

Joel Schneekloth, Regional Water Specialist, Colorado State University Extension, Phone: 970-345-0508, E-mail: [joel.schneekloth@colostate.edu](mailto:joel.schneekloth@colostate.edu)

Babatunde Ojetunde, Graduate Student, Colorado State University, Dept. of Soil and Crop Sciences, E-mail: [batatunde.ojetunde@colostate.edu](mailto:batatunde.ojetunde@colostate.edu)

Dr. Jessica G. Davis, Professor of Pulse Agronomy, Colorado State University, Agricultural Experiment Station, E-mail: [jessica.davis@colostate.edu](mailto:jessica.davis@colostate.edu)

Dr. Henry Thompson, Professor and Director, Cancer Prevention Laboratory, Colorado State University, Dept. of Horticulture and Landscape Architecture, E-mail: [henry.thompson@colostate.edu](mailto:henry.thompson@colostate.edu)

Dr. Gregory Graff, Professor, Colorado State University, Dept. of Agricultural and Resource Economics, E-mail: [gregory.graff@colostate.edu](mailto:gregory.graff@colostate.edu)

John Stromberger, Senior Research Associate, Wheat Quality Lab, Colorado State University, Dept. of Soil & Crop Sciences, Phone: 970-491-2664, Email: [john.stromberger@colostate.edu](mailto:john.stromberger@colostate.edu)

Dr. Esten Mason, Associate Professor and Wheat Breeder, CSU Dept. of Soil and Crop Sciences, Phone: 970-491-5787, E-mail: [esten.mason@colostate.edu](mailto:esten.mason@colostate.edu)

Dr. Jasmine Dillon, Assistant Professor of Global Livestock Sustainability, Cornell University, Dept. of Animal Science, E-mail: [jad553@cornell.edu](mailto:jad553@cornell.edu)

## Acknowledgments

The Colorado State University Crops Testing Program wishes to express their gratitude to our 2025 collaborating farmer, JT Farms at Yuma, CO. This collaborator voluntarily and generously contributed the use of their land, equipment, and time to facilitate the dry bean variety trials.

# 2025 Colorado Black-Eyed Pea, Pinto, Black, and Mayocoba Bean Performance Trials

Sally Jones-Diamond and Jason Webb

The Colorado State University (CSU) Crops Testing Program provides unbiased, current, and reliable research results and information to help Colorado dry bean and pulse crop producers make better decisions. Colorado State University promotes crop variety and agronomic testing as a service to crop producers and seed companies who depend on us for crop performance information.

CSU personnel established two black-eyed pea trials, one irrigated and one dryland, at Akron, Colorado, in collaboration with the USDA-ARS Central Great Plains Research Center. They also conducted irrigated pinto, black, and Mayocoba bean trials at two sites, Yuma and Rocky Ford, Colorado. The latter site in partnership with the Arkansas Valley Research Center.

All trial results were statistically analyzed and reported on the program's website at [csucrops.org](https://csucrops.org) after harvest.

In 2025 the program experienced a substantial increase in dry bean market classes entered into the trials. Beyond the classes listed above there was a variety entered in each of the great northern and a small red market classes. In 2026, the program plans to continue encouraging participation from a broader range of market classes and may expand the trials to additional sites.

## Testing Methods

Varieties were included in the dry bean trials based on paid company and public breeding program entries. Breeders or company representatives select and enter varieties and provide treated seeds for planting. Varieties or landraces in the black-eyed pea variety trials were selected by Crops Testing personnel based on prior year performance or were included as new variety releases. The same black-eyed pea varieties were used in the dryland and irrigated trials to provide a comparison of performance under the two management systems.

All trial entries were arranged in a randomized complete block design with four replications at each site. Plot sizes for the irrigated pinto bean and dryland black-eyed pea trials were four 30" rows wide (10 feet) by 30 feet long. The irrigated black-eyed pea trial plot sizes were two rows wide (5 feet) by 30 feet long. Irrigated trials were conducted using overhead sprinklers (pivot or linear move), with the exception of Rocky Ford, which used siphon tube flood irrigation. Cultural practices for each trial location are included below the individual site tables when available. Management practices generally match the rest of the producer's field. No beans in the variety trials were inoculated.

All locations except Rocky Ford were planted using a four-row Seed Research Equipment Solutions (SRES) 2013 Classic Aire vacuum planter equipped with Monosem seed meters. The

Rocky Ford trial was planted with a John Deere cone planter. The irrigated pinto bean trials were planted at 112,000 seeds per acre. The dryland black-eyed pea trial was planted at 61,500 seeds per acre. The irrigated black-eyed pea trial was planted at 110,000 seeds per acre. All locations except Rocky Ford were harvested using a Zurn 150 combine equipped with an H2 GrainGage weigh system and a platform header. The Rocky Ford plots were harvested using a Case IH 1620 modified plot combine, and grain samples were analyzed on a tabletop grain analysis computer (GAC) 2500 AGRI machine.

### Interpreting Results

The least significant difference (LSD) is provided at the bottom of the yield tables. The LSD is used to help determine whether differences in variety measurements (such as yield, test weight, etc) are statistically different. If the yield difference between two varieties equals or exceeds the LSD value, the difference between them is significant. If two entries being compared have a difference in yield that is less than the LSD value, those two entries are considered not statistically different

Farmers should use the LSD ( $P < 0.30$ ) for selecting superior varieties to minimize economic loss due to false negative conclusions (concluding varieties are the same when they are different). Scientists, academics, and others may wish to use LSD ( $P < 0.05$ ) to minimize the risk of false positive conclusions (concluding varieties are different when they are the same). Variety yields in bold are in the top yield group and are considered equal. Varieties in the tables are sorted from highest to lowest yield within each market class.

Variety selection should be based on more than yield performance. Other factors to consider include maturity, disease resistance, plant architecture, seed quality, and cost.

## 2025 Irrigated Pinto Bean Variety Performance Trial at Yuma

| Variety                       | Source                      | Traits    | Yield <sup>a</sup><br>lb/ac | 2-Year                 | Test            | Seeds/Pound | Moisture<br>percent |
|-------------------------------|-----------------------------|-----------|-----------------------------|------------------------|-----------------|-------------|---------------------|
|                               |                             |           |                             | Average Yield<br>lb/ac | Weight<br>lb/bu |             |                     |
| Gleam                         | Seedwest                    | Slow-Dark | <b>3182</b>                 | -                      | <b>64.5</b>     | 1267        | 13.0                |
| USDA Rattler                  | Kelley Bean                 | -         | <b>3093</b>                 | 3241                   | 61.6            | 1112        | 11.8                |
| Shine                         | Seedwest                    | Slow-Dark | <b>2919</b>                 | -                      | 63.5            | 1166        | 9.3                 |
| SV6139GR                      | Seminis Vegetables by Bayer | -         | 2905                        | 3022                   | 61.9            | 1131        | 9.4                 |
| Mystic                        | Seedwest                    | Slow-Dark | 2885                        | -                      | 62.3            | 1109        | 14.9                |
| Wildcat                       | Farmer Bean and Seed        | Slow-Dark | 2808                        | 2882                   | 62.0            | 884         | 14.8                |
| NE2-22-36                     | Univ. of Nebraska-Lincoln   | Slow-Dark | 2666                        | -                      | 61.8            | 1229        | 14.5                |
| TVS 21-4-6                    | Treasure Valley Seed        | Slow-Dark | 2624                        | -                      | 60.4            | 1160        | 8.6                 |
| Basin                         | Central Bean                | -         | 2535                        | -                      | 62.8            | 1271        | 11.4                |
| USDA Cody                     | USDA-ARS, Prosser, WA       | -         | 2535                        | 2721                   | <b>64.4</b>     | 1319        | 10.9                |
| NE2-22-18                     | Univ. of Nebraska-Lincoln   | -         | 2517                        | -                      | 59.3            | 1017        | 10.1                |
| NE4-17-6                      | Univ. of Nebraska-Lincoln   | Slow-Dark | 2484                        | -                      | 60.1            | 1055        | 11.4                |
| Charro                        | Michigan State Univ.        | -         | 2437                        | 2865                   | 62.8            | 1166        | 9.5                 |
| NE4-17-10                     | Univ. of Nebraska-Lincoln   | Slow-Dark | 2214                        | 2677                   | 58.6            | 1036        | 10.9                |
| NE2-17-37                     | Univ. of Nebraska-Lincoln   | Slow-Dark | 2128                        | 2408                   | 60.8            | 1315        | 10.9                |
| ND Rodeo                      | North Dakota State Univ.    | Slow-Dark | 2066                        | 2992                   | 63.4            | 1239        | 11.3                |
| TVS 21-7-8                    | Treasure Valley Seed        | Slow-Dark | 2046                        | -                      | <b>64.8</b>     | 1239        | 14.3                |
| TVS 21-6-10                   | Treasure Valley Seed        | Slow-Dark | 1831                        | -                      | 59.8            | 1143        | 9.0                 |
| Bronco                        | Treasure Valley Seed        | Slow-Dark | 1792                        | 2336                   | 62.8            | 1160        | 15.1                |
| USDA Diamondback              | Kelley Bean                 | Slow-Dark | 1643                        | 2260                   | 61.8            | 1250        | 12.2                |
| Lava*                         | Central Bean                | -         | 1627                        | -                      | 62.2            | 1330        | 12.4                |
| ND Falcon                     | North Dakota State Univ.    | -         | 1546                        | 2259                   | 57.7            | 1391        | 8.8                 |
| Max                           | Central Bean                | -         | 1481                        | -                      | 60.7            | 1075        | 9.8                 |
| <b>Average</b>                |                             |           | <b>2346</b>                 | <b>2697</b>            | <b>61.7</b>     | <b>1177</b> | <b>11.5</b>         |
| <sup>b</sup> LSD (0.30)       |                             |           | 274                         |                        | 0.6             |             |                     |
| <sup>b</sup> LSD (0.05)       |                             |           | 523                         |                        | 1.1             |             |                     |
| Coefficient of Variation (CV) |                             |           | 9.8%                        |                        | 0.5%            |             |                     |

\*Small red market class

<sup>a</sup>Varieties are ranked from highest to lowest yield. All yields were corrected to 14% moisture.

<sup>b</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

### Site Information

Collaborator: JT Farms  
 Planting Date: June 13, 2025  
 Harvest Date: September 29, 2025  
 Herbicides: Trial cultivated to control palmer amaranth and then hand-weeded for further Palmer amaranth control. Pre-Harvest desiccant: Sharpen at 2 oz/ac and glyphosate at 32 oz/ac with AMS and Tapran applied 11 days prior to harvest.  
 Soil Type: Haxtun loamy sand  
 GPS Coordinates: 40.0733586, -102.5294372  
 Trial Comments: Trial planted into good moisture and had even and excellent stand establishment. Heavy palmer weed pressure, control was good until after flowering, then low to medium pressure in plots. Trial irrigated regularly throughout the summer and desiccated when at least 80% of the plots had greater than 80% dry pods.

*The data included in this table may not be republished without permission. Contact Sally Jones-Diamond (sally.jones@colostate.edu) or Jason Webb (jason.webb@colostate.edu)*

## 2025 Irrigated Black Bean Variety Performance Trial at Yuma

| Variety                       | Source                    | Plant Type            | Yield <sup>a</sup><br>lb/ac | Maturity<br>days | Test            |             |                     |
|-------------------------------|---------------------------|-----------------------|-----------------------------|------------------|-----------------|-------------|---------------------|
|                               |                           |                       |                             |                  | Weight<br>lb/bu | Seeds/Pound | Moisture<br>percent |
| Black Pearl                   | Michigan State University | Upright               | <b>2784</b>                 | 99               | <b>64.5</b>     | 2279        | 8.8                 |
| Slate                         | Seedwest                  | Upright Determinate   | <b>2578</b>                 | 95               | <b>64.9</b>     | 2245        | 9.5                 |
| ND Galaxy                     | NDSU                      | Upright Indeterminate | 2248                        | 98               | <b>64.2</b>     | 2234        | 8.6                 |
| Eiger*                        | Michigan State University | Upright               | 2105                        | 98               | <b>64.4</b>     | 1575        | 14.9                |
| B18094173                     | Seedwest                  | Upright Indeterminate | 2062                        | 95               | 62.6            | 2622        | 9.2                 |
| Kona                          | Michigan State University | Upright               | 1906                        | 98               | 62.3            | 2479        | 9.1                 |
| Butte                         | Seedwest                  | Upright Indeterminate | 1762                        | 95               | <b>63.2</b>     | 2228        | 10.3                |
| Ace                           | Seedwest                  | Upright Indeterminate | 1699                        | 95               | <b>64.3</b>     | 2492        | 9.5                 |
| <b>Average</b>                |                           |                       | <b>2143</b>                 | <b>97</b>        | <b>63.8</b>     | <b>2269</b> | <b>10.0</b>         |
| <sup>b</sup> LSD (0.30)       |                           |                       | 253                         |                  | 2.1             |             |                     |
| <sup>b</sup> LSD (0.05)       |                           |                       | 505                         |                  | 4.2             |             |                     |
| Coefficient of Variation (CV) |                           |                       | 9.6%                        |                  | 1.5%            |             |                     |

\*Great Northern market class

<sup>a</sup>Varieties are ranked from highest to lowest yield. All yields were corrected to 14% moisture.

<sup>b</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

### Site Information

Collaborator: JT Farms

Planting Date: June 13, 2025

Harvest Date: September 29, 2025

Herbicides: Trial cultivated to control palmer amaranth and then hand-weeded for further Palmer amaranth control.

Pre-Harvest desiccant: Sharpen at 2 oz/ac and glyphosate at 32 oz/ac with AMS and Tapran applied 11 days prior to harvest.

Soil Type: Haxtun loamy sand

GPS Coordinates: 40.0733586, -102.5294372

Trial Comments: Trial planted into good moisture and had even and excellent stand establishment. Heavy palmer weed pressure, control was good until after flowering, then low to medium pressure in plots. Trial irrigated regularly throughout the summer and desiccated when at least 80% of the plots had greater than 80% dry

*The data included in this table may not be republished without permission. Contact Sally Jones-Diamond (sally.jones@colostate.edu) or Jason Webb (jason.webb@colostate.edu)*



# 2025 Irrigated Yellow Bean Variety Performance Trial at Yuma

| Variety                       | Source               | Yield <sup>a</sup><br>lb/ac | Maturity<br>days | Test            |             |                     |
|-------------------------------|----------------------|-----------------------------|------------------|-----------------|-------------|---------------------|
|                               |                      |                             |                  | Weight<br>lb/bu | Seeds/Pound | Moisture<br>percent |
| Patron                        | Farmer Bean & Seed   | <b>1763</b>                 | 101              | <b>63.7</b>     | 1260        | 14.9                |
| MY 12724                      | Kelley Bean Co.      | 1528                        | 98               | 61.7            | 1597        | 15.3                |
| Early Barranca                | Central Bean         | 1332                        | 100              | <b>62.9</b>     | 1274        | 13.8                |
| Yellowstone                   | Michigan State Univ. | 1243                        | 94               | <b>63.4</b>     | 1315        | 14.0                |
| Y2033307                      | Seedwest             | 1191                        | 90               | 57.2            | 1454        | 16.5                |
| SV0863                        | Farmer Bean & Seed   | 1002                        | 99               | 60.5            | 1603        | 15.1                |
| <b>Average</b>                |                      | <b>1343</b>                 | <b>97</b>        | <b>61.6</b>     | <b>1417</b> | <b>14.9</b>         |
| <sup>b</sup> LSD (0.30)       |                      | 157                         |                  | 1.0             |             |                     |
| <sup>b</sup> LSD (0.05)       |                      | 312                         |                  | 2.1             |             |                     |
| Coefficient of Variation (CV) |                      | 15.0%                       |                  | 2.9%            |             |                     |

<sup>a</sup>Varieties are ranked from highest to lowest yield. All yields were corrected to 14% moisture.

<sup>b</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

### Site Information

Collaborator: JT Farms  
 Planting Date: June 13, 2025  
 Harvest Date: September 29, 2025  
 Herbicides: Trial cultivated to control palmer amaranth and then hand-weeded for further Palmer amaranth control.  
 Pre-Harvest desiccant: Sharpen at 2 oz/ac and glyphosate at 32 oz/ac with AMS and Tapran applied 11 days prior to harvest.  
 Soil Type: Haxtun loamy sand  
 GPS Coordinates: 40.0733586, -102.5294372  
 Trial Comments: Trial planted into good moisture and had even and excellent stand establishment. Heavy palmer weed pressure, control was good until after flowering, then low to medium pressure in plots. Trial irrigated regularly throughout the summer and desiccated when at least 80% of the plots had greater than 80% dry pods.

*The data included in this table may not be republished without permission. Contact Sally Jones-Diamond (sally.jones@colostate.edu) or Jason Webb (jason.webb@colostate.edu)*

# 2025 Irrigated Dry Bean

## Variety Performance Trial at Rocky Ford

| Variety                                     | Source                      | Traits    | Plant Architecture    | Yield <sup>a</sup><br>lb/ac | Test            |             | Moisture<br>percent |
|---|-----------------------------|-----------|-----------------------|-----------------------------|-----------------|-------------|---------------------|
|   |                             |           |                       |                             | Weight<br>lb/bu | Seeds/Pound |                     |
| <b><u>Pinto</u></b>                         |                             |           |                       |                             |                 |             |                     |
| Shine                                       | ADM Seedwest                | Slow-Dark | Upright Indeterminate | <b>3414</b>                 | 60.0            | 982         | 10.1                |
| TVS 21-7-8                                  | Treasure Valley Seed        | Slow-Dark | Upright Indeterminate | <b>3363</b>                 | 61.1            | 963         | 10.3                |
| Gleam                                       | ADM Seedwest                | Slow-Dark | Upright Indeterminate | <b>3324</b>                 | <b>63.0</b>     | 1131        | 10.3                |
| NE4-17-10                                   | Univ. of Nebraska-Lincoln   | Slow-Dark | -                     | 3042                        | 58.9            | 1055        | 10.4                |
| Charro                                      | Michigan State Univ.        | -         | Upright               | 3009                        | 62.1            | 1052        | 10.7                |
| NE2-22-18                                   | Univ. of Nebraska-Lincoln   | -         | -                     | 2976                        | 59.9            | 926         | 10.0                |
| USDA Diamondback                            | Kelley Bean Co. Inc         | Slow-Dark | Upright               | 2972                        | 60.4            | 971         | 10.9                |
| TVS 21-4-6                                  | Treasure Valley Seed        | Slow-Dark | Upright Indeterminate | 2954                        | 57.7            | 911         | 10.0                |
| USDA Rattler                                | Kelley Bean Co. Inc         | -         | Upright               | 2940                        | 59.5            | 947         | 10.5                |
| Bronco                                      | Treasure Valley Seed        | Slow-Dark | Upright Indeterminate | 2863                        | 60.9            | 949         | 10.6                |
| Mystic                                      | ADM Seedwest                | Slow-Dark | Upright Indeterminate | 2752                        | 61.9            | 884         | 10.6                |
| NE2-17-37                                   | Univ. of Nebraska-Lincoln   | Slow-Dark | -                     | 2521                        | 58.3            | 1057        | 10.7                |
| Wildcat                                     | Univ. of Nebraska-Lincoln   | Slow-Dark | Upright               | 2414                        | 59.3            | 867         | 10.6                |
| NE2-22-36                                   | Univ. of Nebraska-Lincoln   | Slow-Dark | -                     | 2295                        | 59.5            | 907         | 10.5                |
| SV6139GR                                    | Seminis Vegetables by Bayer | -         | Determinate Bush      | 2044                        | 59.4            | 1088        | 10.1                |
| TVS 21-6-10                                 | Treasure Valley Seed        | Slow-Dark | Upright Indeterminate | 2038                        | 58.8            | 971         | 11.5                |
| NE4-17-6                                    | Univ. of Nebraska-Lincoln   | Slow-Dark | -                     | 1956                        | 59.1            | 955         | 10.6                |
| <b><u>Black</u></b>                         |                             |           |                       |                             |                 |             |                     |
| Slate                                       | Seedwest                    | -         | Upright Indeterminate | <b>3050</b>                 | <b>63.8</b>     | 2081        | 10.4                |
| Black Pearl                                 | Michigan State Univ.        | -         | Upright               | <b>2872</b>                 | 62.3            | 1964        | 10.2                |
| Kona  | Michigan State Univ.        | -         | Upright               | <b>2745</b>                 | <b>63.1</b>     | 2150        | 10.1                |
| Ace   | Seedwest                    | -         | Upright Indeterminate | 2402                        | 61.9            | 2071        | 10.1                |
| B18094173                                   | Seedwest                    | -         | Upright Indeterminate | 2160                        | 62.2            | 1807        | 10.8                |
| Butte                                       | Seedwest                    | -         | Upright Indeterminate | 1791                        | 62.3            | 1998        | 10.1                |
| <b><u>Mavacoba &amp; Great Northern</u></b> |                             |           |                       |                             |                 |             |                     |
| Y2033307                                    | Seedwest                    | -         | Upright Determinate   | <b>2528</b>                 | 63.1            | 1281        | 10.3                |
| Patron                                      | Farmer Bean & Seed          | -         | Bush                  | <b>2434</b>                 | <b>63.6</b>     | 1006        | 10.1                |
| Eiger                                       | Michigan State Univ.        | -         | Upright               | <b>2390</b>                 | 60.4            | 1075        | 10.4                |
| SV0863                                      | Seminis Vegetables by Bayer | -         | Bush                  | <b>2185</b>                 | <b>64.3</b>     | 1038        | 11.0                |
| Yellowstone                                 | Michigan State Univ.        | -         | Upright Bush          | 1543                        | 61.6            | 1006        | 11.2                |
| <b>Average</b>                              |                             |           |                       | <b>2606</b>                 | <b>61.0</b>     | <b>1218</b> | <b>10.5</b>         |
| <sup>b</sup> LSD (0.30)                     |                             |           |                       | 345                         | 0.7             |             |                     |
| <sup>b</sup> LSD (0.05)                     |                             |           |                       | 662                         | 1.4             |             |                     |
| Coefficient of Variation (CV)               |                             |           |                       | 9.8%                        | 1.2%            |             |                     |

<sup>a</sup>Varieties sorted by pinto, black, and other market bean classes and then ranked from highest to lowest yield within each class. All yields were corrected to 14% moisture.

<sup>b</sup>If the difference between varieties is equal to or greater than the LSD value, the chance the difference is significant is 70% (for LSD 0.30). Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

### **Site Information**

Collaborator: CSU Arkansas Valley Research Center: Jeff Davidson and Kevin Tanabe  
 Planting Date: June 4, 2025  
 Harvest Date: October 2, 2025  
 Herbicides: None, hand-weeded multiple times.  
 Soil Type: Rocky Ford silty clay loam  
 GPS Coordinates: 38.039605074, -103.6934131  
 Trial Comments: Trial planted into good moisture and had good stand establishment. Heavy bindweed pressure in trial reduced yield. Plots irrigated regularly throughout the summer.

*The data included in this table may not be republished without permission.  
 Contact Sally Jones-Diamond (sally.jones@colostate.edu) or Jeff Davidson (jeffery.davidson@colostate.edu)*

# 2025 Dryland Black-Eyed Pea Variety Performance Trial at Akron

| Variety or Accession          | Origin          | 2-Yr Average                |                |                     |
|-------------------------------|-----------------|-----------------------------|----------------|---------------------|
|                               |                 | Yield <sup>a</sup><br>lb/ac | Yield<br>lb/ac | Moisture<br>percent |
| CB5                           | USA, California | <b>1229</b>                 | 1484           | 12.0                |
| Cp 4906                       | Portugal        | <b>1223</b>                 | 1303           | 12.7                |
| Cp 5556                       | Portugal        | <b>1137</b>                 | 1347           | 12.4                |
| Gorda                         | Puerto Rico     | 1030                        | 1220           | 12.5                |
| 524B                          | USA, California | 957                         | 1137           | 12.4                |
| UCR24                         | USA, California | 942                         | 1091           | 12.8                |
| Vg 72                         | Portugal        | 881                         | 1076           | 12.0                |
| TVu-14253                     | Botswana        | 880                         | -              | 11.5                |
| CB46                          | USA, California | 809                         | 1124           | 12.4                |
| UCR5385                       | USA, California | 796                         | -              | 12.0                |
| CB50                          | USA, California | 615                         | 925            | 12.7                |
| CB77                          | USA, California | 468                         | 920            | 12.5                |
| <b>Average</b>                |                 | <b>914</b>                  | <b>1163</b>    | <b>12.3</b>         |
|                               |                 | <sup>b</sup> LSD (0.30)     | 136            |                     |
|                               |                 | <sup>b</sup> LSD (0.05)     | 262            |                     |
| Coefficient of Variation (CV) |                 | 10.5%                       |                |                     |

<sup>a</sup>Yields corrected to 14% moisture.

<sup>b</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

\*Test weight not recorded due to insufficient sample size at harvest

### Site Information

Collaborator: Central Great Plains USDA-ARS Station  
 Planting Date: June 2, 2025  
 Harvest Date: October 2, 2025  
 Fertilizer: 3 gal/ac 10-34-0 in furrow at planting.  
 Herbicides: Jun 26th: Gatlin 9.0oz/Ac + Brigade 2EC 3.0 oz/Ac + Tapran 2.0  
 Sept. 26th Defoliation: Sharpen 2.0 oz/AC + Tapran 4.0 pts/100 + AMS  
 10#/100 gal.  
 Soil Type: Rago Silt Loam  
 Trial Comments: Seeds were planted 1" deep into excellent moisture. Plots received great and timely moisture throughout the season (15.02").

*The data included in this table may not be republished without permission. Contact Jason Webb (jason.webb@colostate.edu) or Sally Jones-Diamond (sally.jones@colostate.edu).*

## 2025 Irrigated Black-Eyed Pea Variety Performance Trial at Akron

| Variety or<br>Accession       | Origin          | 2-Yr Average                |                | Test            |                     |
|-------------------------------|-----------------|-----------------------------|----------------|-----------------|---------------------|
|                               |                 | Yield <sup>a</sup><br>lb/ac | Yield<br>lb/ac | Weight<br>lb/bu | Moisture<br>percent |
| CB5                           | USA, California | <b>2122</b>                 | 1923           | 56.6            | 20.0                |
| CB46                          | USA, California | <b>1978</b>                 | 1911           | 56.8            | 20.1                |
| Cp 4906                       | Portugal        | <b>1940</b>                 | 1913           | <b>57.2</b>     | 16.9                |
| 524B                          | USA, California | 1892                        | 1897           | 56.4            | 18.8                |
| Cp 5556                       | Portugal        | 1817                        | 1938           | <b>57.7</b>     | 19.1                |
| TVu-14253                     | Botswana        | 1774                        | -              | 55.8            | 27.0                |
| Gorda                         | Puerto Rico     | 1739                        | 1800           | 56.0            | 19.2                |
| UCR24                         | USA, California | 1616                        | 1809           | 54.9            | 19.4                |
| Vg 72                         | Portugal        | 1408                        | 1559           | 55.6            | 18.8                |
| CB50                          | USA, California | 1383                        | 1593           | 54.3            | 19.2                |
| UCR5385                       | USA, California | 897                         | -              | 56.0            | 24.3                |
| CB77                          | USA, California | 439                         | 1112           | -               | 18.8                |
| <b>Average</b>                |                 | <b>1584</b>                 | <b>1745</b>    | <b>56.1</b>     | <b>20.1</b>         |
|                               |                 | <sup>b</sup> LSD (0.30)     | 191            | 0.5             |                     |
|                               |                 | <sup>b</sup> LSD (0.05)     | 365            | 0.9             |                     |
| Coefficient of Variation (CV) |                 | 12.4%                       |                | 0.6%            |                     |

<sup>a</sup>Yields corrected to 14% moisture.

<sup>b</sup>Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding varieties are the same when they are actually different). Companies or researchers may use the LSD (.05) to avoid false positive conclusions (concluding varieties are different when they are actually the same).

### Site Information

Collaborator: Central Great Plains USDA-ARS Station  
 Planting Date: May 30, 2025  
 Harvest Date: October 1, 2025  
 Fertilizer: 15 gpa 10-34-0 via strip till. 3 gal/ac 10-34-0 in furrow at planting.  
 Herbicides: Jun 26th: Gatlin 9.0oz/Ac + Brigade 2EC 3.0 oz/Ac + Tapran 2.0 pts/100 gal.  
 July 22nd: Beyond Xtra 4.0 oz/Ac + Basagran 5L 0.5 pts/Ac + Tapran 4.0 pts/100 + AMS 12#/100 gal.  
 Sept. 26th Defoliation: Sharpen 2.0 oz/AC + Tapran 4.0 pts/100 + AMS 10#/100.  
 Irrigation: 0.83" applied on August 8th  
 Soil Type: Rago Silt Loam  
 Trial Comments: Seeds were planted 1" deep into excellent moisture. Plots received great and timely moisture throughout the season (15.02") and only required 1 irrigation (0.83").

*The data included in this table may not be republished without permission. Contact Jason Webb (jason.webb@colostate.edu) or Sally Jones-Diamond (sally.jones@colostate.edu).*

## 2020-2025 Dryland Black-Eyed Pea Variety Performance Trials at Akron

| Variety or<br>Accession | Origin          | # Years | Multi-<br>Year<br>Avg.<br>Yield <sup>a</sup> | % of<br>Average | 2025<br>Yield | 2024<br>Yield | 2023<br>Yield | 2022<br>Yield | 2020<br>Yield |
|-------------------------|-----------------|---------|--|-----------------|---------------|---------------|---------------|---------------|---------------|
|                         |                 |         |  |                 | lb/ac         |               |               |               |               |
| CB5                     | USA, California | 4       | 1062   | 131%            | <b>1229</b>   | <b>1739</b>   | 701           | 580           | -             |
| Cp 5556                 | Portugal        | 5       | 936  | 116%            | <b>1137</b>   | 1556          | 538           | 522           | 927           |
| Cp 4906                 | Portugal        | 5       | 932  | 115%            | <b>1223</b>   | 1384          | 347           | 520           | 1188          |
| CB50                    | USA, California | 2       | 926  | 114%            | 615           | 1236          | -             | -             | -             |
| CB77                    | USA, California | 2       | 920  | 114%            | 468           | 1371          | -             | -             | -             |
| 524-B                   | USA, California | 5       | 895  | 111%            | 957           | 1317          | 906           | <b>666</b>    | 631           |
| Gorda                   | Puerto Rico     | 5       | 890  | 110%            | 1030          | 1411          | 669           | 573           | 769           |
| CB46                    | USA, California | 5       | 884  | 109%            | 809           | 1438          | 706           | <b>688</b>    | 781           |
| UCR24                   | USA             | 5       | 852  | 105%            | 942           | 1240          | 722           | 607           | 750           |
| TVu-14253               | Botswana        | 3       | 803  | 99%             | 880           | -             | 717           | <b>812</b>    | -             |
| Vg72                    | Portugal        | 5       | 791  | 98%             | 881           | 1270          | 406           | 481           | 915           |
| UCR5385                 | Italy           | 4       | 692  | 86%             | 796           | -             | 620           | 561           | 792           |
| CB27                    | USA, California | 2       | 644  | 80%             | -             | -             | 616           | <b>671</b>    | -             |
| Vg50                    | Portugal        | 3       | 639  | 79%             | -             | -             | 547           | 535           | 834           |
| UCR5275                 | Australia       | 3       | 600  | 74%             | -             | -             | 375           | <b>789</b>    | 634           |
| 1393-1-2-3(-)           | USA, California | 3       | 478  | 59%             | -             | -             | 465           | 504           | 467           |
| <b>Average</b>          |                 |         | <b>809</b>                                   | <b>100%</b>     | <b>914</b>    | <b>1396</b>   | <b>595</b>    | <b>608</b>    | <b>790</b>    |

<sup>a</sup>Yields corrected to 14% moisture.

Bold numbers are statistically significant at LSD (0.30) for that year. Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding variety are the same when they are actually different).

*The data included in this table may not be republished without permission. Contact Jason Webb (jason.webb@colostate.edu) or Sally Jones-Diamond (sally.jones@colostate.edu).*

## 2023-2025 Irrigated Black-Eyed Pea Variety Performance Trial at Akron

| Variety or<br>Accession | Origin          | Data<br>Years | Multi-Year<br>Average Yield <sup>a</sup><br>lb/ac | % of Average<br>Yield | 2025<br>Yield<br>lb/ac | 2024<br>Yield | 2023<br>Yield |
|-------------------------|-----------------|---------------|---|-----------------------|------------------------|---------------|---------------|
| CB5                     | USA, California | 2             | 1923  | 124%                  | <b>2122</b>            | 1725          | -             |
| 524B                    | USA, California | 3             | 1734  | 112%                  | 1892                   | <b>1902</b>   | <b>1407</b>   |
| CB46                    | USA, California | 3             | 1698  | 109%                  | <b>1978</b>            | <b>1843</b>   | <b>1274</b>   |
| Cp 5556                 | Portugal        | 3             | 1674  | 108%                  | 1817                   | <b>2058</b>   | 1146          |
| Gorda                   | Puerto Rico     | 3             | 1668  | 107%                  | 1739                   | <b>1860</b>   | <b>1406</b>   |
| Cp 4906                 | Portugal        | 3             | 1665  | 107%                  | <b>1940</b>            | <b>1886</b>   | 1170          |
| UCR24                   | USA, California | 3             | 1599  | 103%                  | 1616                   | <b>2001</b>   | 1181          |
| CB50                    | USA, California | 2             | 1593  | 103%                  | 1383                   | 1804          | -             |
| TVu-14253               | Botswana        | 2             | 1582  | 102%                  | 1774                   | -             | <b>1390</b>   |
| Vg 72                   | Portugal        | 3             | 1453  | 94%                   | 1408                   | 1711          | <b>1241</b>   |
| CB77                    | USA, California | 2             | 1112  | 72%                   | 439                    | 1785          | -             |
| UCR5385                 | USA, California | 2             | 938   | 60%                   | 897                    | -             | 979           |
| <b>Average</b>          |                 | <b>3</b>      | <b>1553</b>                                       | <b>100%</b>           | <b>1584</b>            | <b>1858</b>   | <b>1244</b>   |

<sup>a</sup>Yields corrected to 14% moisture.

Bold numbers are statistically significant at LSD (0.30) for that year. Farmers selecting a variety based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding variety are the same when they are actually different).

*The data included in this table may not be republished without permission. Contact Jason Webb (jason.webb@colostate.edu) or Sally Jones-Diamond (sally.jones@colostate.edu).*

## BEAN BREAD: A MARKET OPPORTUNITY FOR BLACK-EYED PEAS?

B.S. Ojetunde, Henry Thompson, Gregory Graff, John Stromberger, Esten Mason, J.A. Dillon, J.G. Davis

In recent years, growing black-eyed peas (BEP) has provided an alternative rotation crop while also spreading risk for Colorado growers. The primary driver has traditionally been domestic demand for BEP consumption on New Year's Day. Development of additional markets could be beneficial as acreage grows.

Bread is widely consumed in the USA and around the world. While satisfying customer desires for plant-based, sustainable, and healthful options, Bean Bread made with wheat and BEP flour is an inventive way to improve the nutritional profile of a staple food. Beans are rich in high-quality protein, dietary fiber, essential minerals (iron, potassium, magnesium), and B vitamins. Hence, including BEP flour in bread could be considered a “stealth-health” approach to improving diets without making large shifts in food consumption patterns.

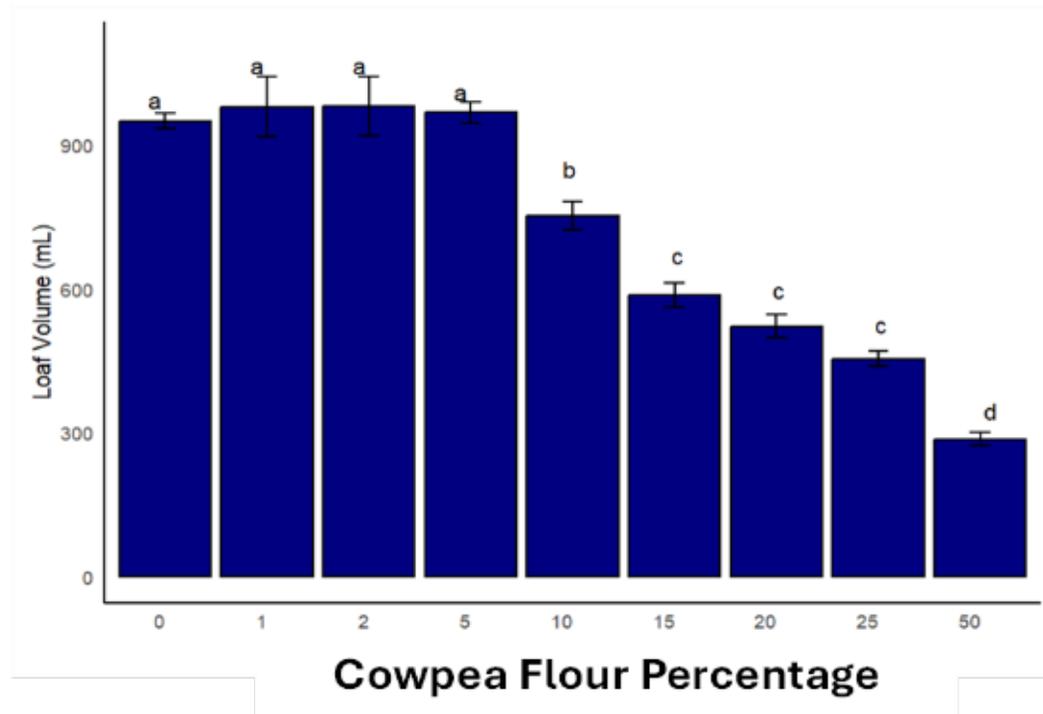
We made Bean Breads for evaluation using two different pinto bean flours (Rattler, Diamondback) and three different BEP flours: US ‘California Blackeye 46’ raw; US ‘California Blackeye 46’ roasted; and Nigerian raw (Soboye Foods Enterprises, Abeokuta, Nigeria) purchased from Lagos International Market in Aurora, Colorado. Protein content was higher in BEP flours (22.2%) as compared to pinto bean flour (19.0%), and lectins were 10x higher in pinto bean flour than in BEP flour. Lectins are anti-nutrients that are known to be high in uncooked bean flours, but they are effectively inactivated during baking. Based on these results, we focused our research on BEP flour.

Increasing the BEP flour amount from 0% (100% wheat flour) up to 50% BEP flour reduced loaf volume (Figure 1). Overall, incorporating up to 5% BEP flour yielded acceptable volume and porosity (Figure 2); however, adding ascorbic acid or vital wheat gluten into the dough increased loaf volume in the 10% breads to match the 100% wheat bread.



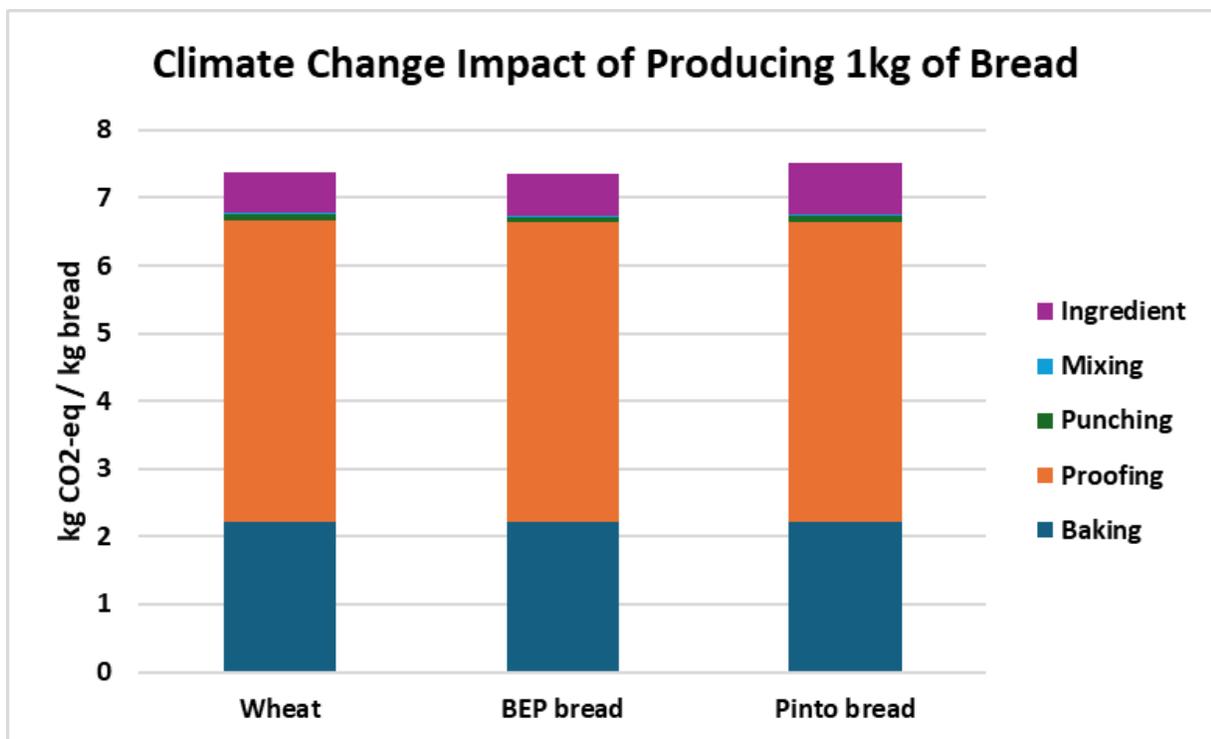
**Figure 1.** Bean Breads produced using different BEP flour amounts (0, 1%, 2%, 5%, 10%, 15%, 20%, 25%, and 50%).

Next, we conducted taste testing to assess appearance, texture, taste, aroma, color, and overall acceptability of different BEP Bean Bread recipes. Participants did not know what they were testing, and more than 80 people participated in each of five experiments (each experiment compared 3 to 4 different recipes). The results of the sensory analysis revealed strong consumer acceptance of the 5% and 10% BEP breads. Additionally, most participants were willing to pay more for the Bean Bread, especially if it offered nutritional and environmental benefits.



**Figure 2.** Impact of BEP flour percentages on loaf volume. Cowpea flour percentages with a common letter are not significantly different ( $P < 0.05$ ) based on Tukey’s Multiple Comparisons Test.

We did life cycle assessment to evaluate the environmental impact of the different breads. Some of the results were predictable. For example, irrigated crops (e.g., pinto beans) had higher water use than dryland crops. And because irrigation increases yield, land use to produce the same amount of flour is less for irrigated BEP than for dryland BEP. We also evaluated the impact of the different breads from field production through baking on greenhouse gas (GHG) emissions, and we found that using 10% BEP flour had no effect on GHG emission compared to 100% wheat bread (Figure 3). However, using pinto bean flour increased GHG emissions, specifically in the ingredient category, by 28.3%.



**Figure 3.** Greenhouse gas emissions (kg CO<sub>2</sub> eq) of 1 kg of bean bread using 10% BEP or pinto bean flour compared to 100% wheat bread.

In conclusion, 10% BEP-enriched Bean Bread presents a nutrient-dense, consumer-accepted, and sustainably sourced alternative to traditional wheat bread. Bakeries could make this product to meet taste, nutrition, and environmental standards by optimizing replacement levels (we recommend 10% maximum) and using healthy, locally grown ingredients. This opens new business potential in the eco-friendly and health-conscious sectors.

# Nitrogen and Inoculant Management for Black-Eyed Peas in Colorado

Joel Schneekloth, Jason Webb and Sally Jones-Diamond

**Introduction:** Black-eyed pea production has increased in the Central High Plains region. Little is known about fertility management or the impact of inoculants on grain yield in this crop. Legumes such as soybean generally show an increase in yield with inoculants applied, which increase nitrogen fixation. During the years of growing black-eyed peas at Akron, Colorado, little nodulation was seen on plant roots.

**Study:** A field study began in 2023 at Akron, Colorado. That year, a dry peat-based inoculant was tested. Severe hail damage caused highly variable yields, and nodulation with the peat inoculant was inconsistent. Fewer than half of the plants developed nodules. In 2024 and 2025, a liquid in-furrow inoculant, Primo CL by Verdesian, was utilized. Additional treatments included applying 30 lb/ac of nitrogen at early bloom, combining the inoculant with the 30 lb/ac of nitrogen, and comparing these treatments against a control with no inoculant or nitrogen application.

**Results:** Over the two-year study, both the inoculant only and the combination of inoculant and nitrogen significantly increased yields compared to the control treatment (Table 1). Average yield increases were 193 to 259 lb per acre greater than the control, respectively. Nitrogen alone did not statistically increase yields over the control treatment.

Economics of fertilizer or inoculant results were similar to the grain yield results (Table 2). Application of 30 lbs of N per acre cost \$22.20 per acre at \$0.74 per lb N. Inoculant applications were done at planting at a cost of \$8.36 per acre in 30-inch rows. Price was based on retail prices given by Verdesian. Based upon a crop price of \$50 per cwt, net returns for inoculant and nitrogen applications were \$98 per acre greater than the control. Inoculant alone was \$87 per acre greater than the control.

**Conclusion:** Based upon the results of the two-year study, the application of both nitrogen and inoculant are advisable for long-term economic advantage. However, the cost of nitrogen application was not factored into the economics. Nitrogen can be applied by either a ground rig applicator or by fertigation. Application by a ground rig will increase costs significantly more than by application via fertigation.

**Table 1.** Grain yield of black-eyed peas in 2024 and 2025 by nitrogen and/or inoculant application. Letters within a column denote a statistical difference (LSD 0.20).

| <b>Treatment</b> | <b>2024</b>                    |    | <b>2025</b> |    | <b>Average</b> |    |
|------------------|--------------------------------|----|-------------|----|----------------|----|
|                  | <b>Yield (pounds per acre)</b> |    |             |    |                |    |
| I + N            | 1921                           | ab | 2346        | a  | 2134           | a  |
| Inoculant        | 1943                           | a  | 2192        | ab | 2068           | a  |
| Nitrogen         | 2011                           | a  | 1997        | b  | 2004           | ab |
| Control          | 1728                           | b  | 2022        | b  | 1875           | b  |

**Table 2.** Grain yield of Black-Eyed peas in 2024 and 2025 by nitrogen and/or inoculant application. Letters within a column denote a statistical difference (LSD 0.20).

| <b>Treatment</b> | <b>2024</b>                      |    | <b>2025</b> |    | <b>Average</b> |    |
|------------------|----------------------------------|----|-------------|----|----------------|----|
|                  | <b>Return (dollars per acre)</b> |    |             |    |                |    |
| I + N            | \$930                            | ab | \$1,143     | a  | \$1,036        | a  |
| Inoculant        | \$963                            | ab | \$1,088     | ab | \$1,025        | a  |
| Nitrogen         | \$983                            | ab | \$976       | b  | \$980          | ab |
| Control          | \$864                            | b  | \$1,011     | ab | \$938          | b  |