

## MEMORANDUM

**TO:** Prairie Recommending Committee for Pulse and Special Crops

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**SUBJECT:** Request for Support for Registration of Navy Bean 5177CBB-3-2

5177CBB-3-2 was tested in the SSNR Trials in 2019 -2021. It is derived from a cross between ACUG 10-6 and a breeding line selected from a cross between 1190M-13 and breeding line 3619-9 (Fig. 1). The last cross was made in winter 2014. It carries the SU91 marker associated with CBB tolerance.

It is higher yielding than both Envoy and Portage and on average 2 days later maturing. The plants are upright, indeterminate and are taller than both Envoy and Portage. Seeds are slightly larger in size than Envoy and Portage. It is susceptible to both races of anthracnose, as is Portage; Envoy is resistant to race 73 only. The post cooking scores and canning results were better than Envoy and not significantly worse than Portage.

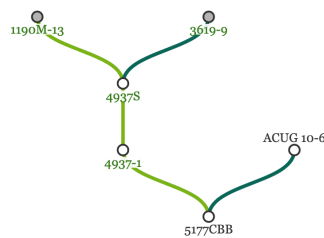


Figure 1. Pedigree of breeding line 5177CBB-3-2.

### Strengths

- Much higher yielding than Portage (121 %)
- Carries the SU91 marker for CBB tolerance
- Canning and cooking scores similar to or better than the checks

### Neutral Traits

- 2 days later Portage and Envoy

### Weaknesses

- Susceptible to anthracnose races 73 and 105 as is Portage

## Performance Data

Table 1: Extract from Three year agronomic performance data for the 2019-2021 Short Season Narrow Row Dry Bean Co-operative Trial in western Canada

| Line         | Class | Yield(kg/ha) |      |      |      | % of MC-C | Days to flower |      |      |      | Days to mature |      |      |      |
|--------------|-------|--------------|------|------|------|-----------|----------------|------|------|------|----------------|------|------|------|
|              |       | 2019         | 2020 | 2021 | Mean |           | 2019           | 2020 | 2021 | Mean | 2019           | 2020 | 2021 | Mean |
| DC Blackstrá | Black | 2614         | 1837 | 2713 | 2398 | 100       | 58             | 58   | 50   | 56   | 104            | 93   | 89   | 98   |
| Envoy        | Navy  | 1907         | 1184 | 2147 | 1740 | 100       | 59             | 58   | 50   | 56   | 105            | 98   | 91   | 100  |
| Portage      | Navy  | 2177         | 1754 | 1781 | 1955 | 112       | 58             | 57   | 51   | 56   | 105            | 97   | 92   | 100  |
| 5177CBB-3-2  | Navy  | 2449         | 1896 | 2078 | 2193 | 126       | 59             | 58   | 48   | 55   | 108            | 99   | 92   | 102  |

| Line         | Class | Pod Clearance (%) |      |      |      | Plant Height (cm) |      |      |      | Seed Weight (g/1000) |      |      |      | Lodging (1-5) |      |
|--------------|-------|-------------------|------|------|------|-------------------|------|------|------|----------------------|------|------|------|---------------|------|
|              |       | 2019              | 2020 | 2021 | Mean | 2019              | 2020 | 2021 | Mean | 2019                 | 2020 | 2021 | Mean | 2019          | 2021 |
| DC Blackstrá | Black | 76                | 79   | 84   | 79   | 55                | 40   | 55   | 48   | 209                  | 196  | 210  | 206  | 1.1           | 1.3  |
| Envoy        | Navy  | 71                | 74   | 73   | 72   | 50                | 36   | 54   | 44   | 181                  | 158  | 173  | 172  | 2.1           | 1.7  |
| Portage      | Navy  | 73                | 72   | 79   | 74   | 57                | 41   | 55   | 49   | 178                  | 181  | 175  | 178  | 1.3           | 1.3  |
| 5177CBB-3-2  | Navy  | 81                | 81   | 82   | 81   | 64                | 55   | 57   | 58   | 186                  | 183  | 194  | 187  | 1.3           | 1.5  |

Table 2: Extract from anthracnose data for entries in the 2021 Short Season Narrow Row Dry Bean Co-operative Trial in western Canada  
Means followed by the same letter did not significantly differ (LSD<sub>0.05</sub>)

| Saskatoon Short Season Narrow Row Coop |           |       | Dry Bean Anthracnose Race Reactions - 2021 |      |         |      |          |      |         |      |
|--|-----------|-------|--|------|---------|------|----------|------|---------|------|
| Entry                                  | Cultivar  | Class | Race 73                                    |      |         |      | Race 105 |      |         |      |
|  |           |       | Test #1                                    |      | Test #2 |      | Test #1  |      | Test #2 |      |
|  |           |       | Est.                                       | Rank | Est.    | Rank | Est.     | Rank | Est.    | Rank |
| 1                                      | CDC Black | BK    | 8.7  | bc   | 9       | bcd  | 9        | c    | 7.8     | c    |
| 2                                      | Envoy     | NA    | 0  | acd  | 0       | ac   | 5.9      | ac   | 3.2     | ad   |
| 3                                      | Portage   | NA    | 8.2  | bd   | 9       | bcd  | 9        | c    | 4.3     | ad   |
| 14                                     | 5177CBB   | NA    | 9  | bc   | 8.3     | bcd  | 9        | c    | 8.8     | c    |
| 25                                     | Envoy     | NA    | 0  | abcd | 0       | ac   | 8.3      | c    | 6       | c    |
| 26                                     | AC Pintob | PT    | 8.6  | abcd | 9       | bcd  | 9        | c    | 8.2     | c    |
| 27                                     | Othello   | PT    | 4.3  | abcd | 4.1     | abd  | 0.8      | abd  | 1.8     | abd  |
| 28                                     | Dresden   | NA    | 0  | a    | 0       | ac   | 8.3      | c    | 8       | c    |

|           |        |        |        |        |
|-----------|--------|--------|--------|--------|
| Num DF    | 27     | 27     | 27     | 27     |
| Den DF    | 56     | 56     | 54     | 55     |
| F Value   | 19.41  | 22.49  | 28.48  | 24.38  |
| P>F       | <.0001 | <.0001 | <.0001 | <.0001 |
| LSD(0.05) | 2.4    | 2.3    | 2      | 2      |

Dunnets Test  
a = significantly different than AC Pintoba      c = significantly different than Othello  
b = significantly different than Envoy            d = significantly different than Dresden

Table 3: Extract from Cooking and Canning Quality Evaluation of Select Dry Bean Lines in the 2020 Short Season Narrow Row Dry Bean Cooperative Trial in western Canada

| Genotype    | 100-seed wt. (g) | Hydration Co-efficie |                   |                 |                  |                     | Canning quality |      |      |              |      |                    |               | Cooking quality             |               |                             |       |
|-------------|------------------|----------------------|-------------------|-----------------|------------------|---------------------|-----------------|------|------|--------------|------|--------------------|---------------|-----------------------------|---------------|-----------------------------|-------|
|             |                  | HCS (16 h, 21°C)     | HCB (3 min, 93°C) | Drained Wt. (%) | Matting (1 to 4) | Appearance (1 to 4) | Dry color       |      |      | Canned color |      |                    |               | 16 h at 21°C                |               | 20 min at 93°C              |       |
|             |                  |                      |                   |                 |                  | L*                  | a*              | b*   | L*   | a*           | b*   | Texture (kg force) | Hard seed (%) | Partially hydrated seed (%) | Hard seed (%) | Partially hydrated seed (%) |       |
| <b>Navy</b> |                  |                      |                   |                 |                  |                     |                 |      |      |              |      |                    |               |                             |               |                             |       |
| Envoy       | 17.0             | 1.8                  | 2.0               | 61.2            | 2.0              | 3.3                 | 100.0           | 8.2  | 18.1 | 47.5         | 18.8 | 28.0               | 33.8          | 21.8                        | 1.3           | 0.8                         | 2.8   |
| Portage     | 19.2             | 2.1                  | 2.2               | 62.1            | 2.7              | 3.3                 | 100.0           | 6.6  | 16.3 | 49.6         | 18.8 | 29.7               | 23.4          | 0.0                         | 0.0           | 0.0                         | 0.0   |
| 5177CBB-3-2 | 18.4             | 2.0                  | 2.1               | 62.7            | 1.3              | 2.0                 | 100.0           | 5.5  | 19.9 | 48.4         | 18.3 | 28.3               | 31.4          | 6.5                         | 1.2           | 0.3                         | 0.2   |
| LSD         | 23.4             | 0.1                  | 0.1               | 11.3            | 1.8              | 1.4                 | 19.4            | 6.3  | 4.9  | 1.8          | 1.2  | 1.6                | 12.4          | 11.1                        | 3.6           | 1.3                         | 6.3   |
| CV          | 5.4              | 4.1                  | 4.1               | 10.5            | 55.2             | 26.5                | 13.2            | 32.8 | 17.7 | 2.5          | 4.9  | 4.9                | 23.7          | 35.1                        | 62.7          | 145.7                       | 100.7 |

