BRS 7762 Supremo - A black common bean cultivar with erect plant type

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ABSTRACT - The black bean cultivar BRS 7762 Supremo developed by Embrapa Rice and Beans was released for cultivation in the States Santa Catarina, Paraná, Goiás and the Federal District. This cultivar is resistant to several rust pathotypes, to bean common mosaic virus and to four pathotypes caused by the anthracnose agent.

Key words: Phaseolus vulgaris, plant breeding, cultivar description, reaction diseases.

INTRODUCTION

During the 2003/2004 crop season, about 2.7 million tons of common bean were produced in Brazil on an area of 2.7 million hectares, i.e., a national average productivity of 1.000 kg ha⁻¹. Although the average productivity has increased, the average per capita consumption has been decreasing attaining an annual consumption of only 12.7 kg inhabitant⁻¹. In Brazil, the national production of black beans does not meet the internal consumption demand, which is particularly true for the states in the south as well as Rio de Janeiro and Espírito Santo. An annual import of about 100 thousand tons is necessary to meet this demand. The common bean genetic improvement program of Embrapa Rice and Beans is focused on cultivars that are more productive, more disease resistant and have an erect plant type enabling mechanical harvest, offering the final consumer a better product quality and the farmers a higher revenue.

CULTIVAR ORIGIN AND DEVELOPMENT

BRS 7762 Supremo is a black bean originated from the single cross of W22-34 and VAN 163, performed at Embrapa Rice and Beans in 1988. The bulk method was used in the F₂ generation. In F₃ and F₄, after inoculation with the pathotype 89 of Colletotrichum lindemuthianum, the modified mass selection was performed and susceptible plants were eliminated. One pod per plant was collected from the remaining resistant plants to reconstitute the population. In F₅, the remaining plants were harvested originating individually the F₆ lines from which line AN 9310960 was selected based on grain yield, erect plant type and disease resistance. In 1999 this line was

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evaluated along with additional 31 lines and two controls in the National Trial in six different environments (states Goiás (1), Mato Grosso do Sul (2), Minas Gerais (1), Rio de Janeiro (1) and Espírito Santo (1)). The joint analysis of the grain yield data and other agronomic traits distinguished AN 9310960 to be promoted to the Regional Trial under the pre-commercial name CNFP 7762.

PERFORMANCE

Line CNFP 7762 was evaluated in a field trial for cultivar release with twelve lines and two controls in a randomized complete block design with four replications in 30 different environments in the States Goiás (13), Federal District (2), Paraná (7) and Santa Catarina (8). In the field trials conducted during the wet and dry seasons in the States of Santa Catarina and Paraná and in field trials during the wet and winter seasons in the State of Goiás and Federal District, line CNFP 7762 presented a 2% superior average grain yield over cultivars IPR 88 - Uirapuru and BRS Valente in the States Santa Catarina and Paraná and Diamante Negro and BRS Valente in Goiás and the Federal District (Table 1).

OTHER CHARACTERISTICS

Industrial and technological grain quality

Cultivar BRS 7762 Supremo presents uniform grain size and color, excellent cooking qualities (cooking time of 31 minutes), and a chocolate brown broth (Table 2).

Reaction to diseases

Cultivar BRS 7762 Supremo, under artificial inoculation, was resistant to bean common mosaic virus and to the pathotypes 55 (lambda), 89 (alfa-Brazil), 95 (kappa) and 453 (zeta) of Colletotrichum lindemutianum. The cultivar reacted resistant to several rust pathotypes, moderately resistant to angular leaf spot and susceptible to bean golden mosaic virus and common bacterial blight in field trials.

Plant type

BRS 7762 Supremo presents an erect growth habit with high yield potential in all tested crop systems under different soil and environmental conditions. It also has good lodging resistance and a growth cycle of 83 days from emergency to physiological maturation.

SEED PRODUCTION

Genetic seed stocks are maintained by Embrapa Rice and Beans and basic seed is available at Embrapa Technology Transfer.

PARTNER INSTITUTIONS IN THE CULTIVAR ASSESSMENT

Table 1. Yield of cultivar BRS 7762 Supremo during the wet and dry seasons in the states Santa Catarina and Paraná and in wet and winter seasons in Goiás and the Federal District, obtained from 2001 to 2004 and compared to yields of two controls

<table>
<thead>
<tr>
<th>Region</th>
<th>State</th>
<th>Season</th>
<th>BRS 7762 Supremo (kg ha⁻¹)</th>
<th>Mean for Control¹ (kg ha⁻¹)</th>
<th>Relative yield (%)</th>
<th>Nr. of environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>South</td>
<td>SC/PR</td>
<td>wet</td>
<td>2464</td>
<td>2438</td>
<td>101</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dry</td>
<td>2499</td>
<td>2263</td>
<td>110</td>
<td>5</td>
</tr>
<tr>
<td>Center-West</td>
<td>GO/DF</td>
<td>wet</td>
<td>2322</td>
<td>2355</td>
<td>99</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>winter</td>
<td>2401</td>
<td>2285</td>
<td>105</td>
<td>4</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>2410</td>
<td>2358</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

¹ IPR 88 - Uirapuru and BRS Valente in Santa Catarina and Paraná, and Diamante Negro and BRS Valente in Goiás and the Federal District

Table 2. Industrial and technological grain qualities of the black bean cultivar BRS 7762 Supremo

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Cooking time</th>
<th>Soluble solids</th>
<th>Protein</th>
<th>100 grain weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(min.)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>BRS 7762 Supremo</td>
<td>31.0</td>
<td>12.1</td>
<td>23.3</td>
<td>24.6</td>
</tr>
<tr>
<td>BRS Valente</td>
<td>28.1</td>
<td>10.9</td>
<td>19.2</td>
<td>21.5</td>
</tr>
<tr>
<td>Diamante Negro</td>
<td>34.0</td>
<td>11.2</td>
<td>20.0</td>
<td>21.3</td>
</tr>
</tbody>
</table>

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CONCLUSION

BRS 7762 Supremo is a new option for bean producers interested in the black bean grain type for cultivation in the wet and dry seasons in the States Santa Catarina and Paraná and wet and winter seasons in Goiás and the Federal District.