EVALUATION OF *Phaseolus vulgaris* L. GENOTYPES FOR THEIR PERFORMANCE AGAINST "Common Bacterial Blight" (Xcp) FROM SALTA (ARGENTINA)

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Introduction

Argentinean production of *P. vulgaris L.* is concentrated in the northeast region (NOA) of which the province of Salta accounts for approximately 72% (178,000 t/year). Among the endemic diseases with a higher impact in the area "Common Bacterial Blight" particularly stands out which negatively affects performance and the quality of the grain by staining, reducing its size and shine. Falls in yield have been estimated at between 15 – 20%, which in turn have been estimated between values of 20 and 25 million dollars per year. Rejections due to stains in commercial type "large white" or "Alubia" can reach up to 10% (INTA estimation).

The wide diffusion of this pathogen, its association with the seed and the low effectiveness of chemical control has presented us with the need to consider an integrated management programme for the crop using better quality seeds and resistant varieties.

There are improved lines available for their resistance to this disease: VAX, developed in CIAT from an interspecific cross between *Phaseolus vulgaris L. x P. acutifolius L.* (Singh and Muñoz, 1999), which were evaluated for 20 isolates from Africa and Latin America showing good performance (Jara et al., 1999). From XAN 159, also derived from interspecific crossing between *P. vulgaris L. x P. acutifolius L*, HR lines were obtained from the "navy bean" type and improved in this aspect (Park et al., 1998).

The different genetic systems that can control the reaction to this disease in different parts of the plant have already been established. The identification of the sources of resistance to the local strains and the differentiation between them depending on the moment in the cycle and the part of the plant in which they are resistant are useful for the selection of parent stock that provide complementary resistance genes allowing widely resistant local varieties to be obtained.

Objectives

The objectives of this study were: a) to identify resistance sources to the isolates of Xcp from Argentina; b) to detect whether there is differential performance between these entries throughout the phenological cycle of the crop.

Materials and Methods

The materials were evaluated for an isolate of *Xcp var. fuscans (Ac)*, highly pathogenic, obtained from plants with symptoms from the variety "Alubia Selección Cerrillos INTA" from a crop grown in Cerrillos during 2001.

Eighteen lines of *Phaseolus vulgaris L.* were evaluated which had been tested in other regions of the world and behaving as resistant: CO-245-2/97, CO-261-2/97, CO-286-1/97, CO-311-4/97 (provided by Dr. Asensio); C-01-1, C-01-2, C-01-3, C-01-5, C-01-6, (VAX lines); C-01-7, C-01-8,C-01-9,C-01-23,C-01-25,C-01-26,C-01-27,C-01-28 y C-01-29 (provided by CIAT). HR-45 line (provided by Dr. Park) and C01-4 (VAX-4) (provided by CIAT) were used as resistant controls; and the local varieties with a known performance against the disease: Perla INTA and Paloma INTA (intermediate controls), and Alubia Selección Cerrillos INTA and TUC-180 (Estación Agroindustrial Obispo Colombres-EEAOC) (susceptible controls) were also

used. The assay was carried out in a greenhouse in the area of Cerrillos (24° 54' S; 65° 29' W; 1250 masl), Salta, Argentina. A random block design was made with 6 repetitions and three controls per material. The blocks were distributed throughout the whole greenhouse according to the radiation gradient and the temperature.

Seeding took place in individual plant pots on 5/10, and the inoculations on three different dates: **1)** on the leaves, vegetative state (date: 25/10); 2) on leaves, before flowering (5/11); and **3)** in pods during swelling with grains (5/12). The evaluations were made on the following dates: 5/11, 26/11 and 10/12 respectively.The leaves were inoculated using the multiple needles method, and the pods were punctured using histological needles with an inoculum of 1 x 10^7 ufc/ml obtained from a cultivar of Ac in nutrient agar medium (NA) for 40 hours at 28 °C (Lienert and Schwartz,1994).

The following scale was used for evaluation: **1** Absence of symptoms. **2** Dry necrosis around the incision. **3** Oily halo around the incision. **4** Widespread necrosis. The results were analysed through an ANOVA, with the LSD test for the comparison of averages.

Results

Significant differences were found between the materials in each of the three phenological stages. Significant differences were only determined between blocks after the evaluation of the pods.

A slight variation in the reaction in the leaves to the disease from the vegetative through to the pre flowering stage was observed.

Of the nine materials that performed as immune in the leaf during the first evaluation, only two of them (C-01-6 and C-01-3) kept this immunity through to the second evaluation. The symptoms were slight for four in them (C-01-7, C-01-27, HR-45 and C-01-8), statistically equal to the two immune ones. VAX-4, C-01-5 and C-01-9 showed a more severe reaction and were statistically different from the first six.

Immun ity was observed in pods in the material CO-286-1/97.

The assay was less discriminatory in pods than in leaves. The difference observed between blocks 1 and 3 (extremes of the greenhouse) could be due to the higher temperature speeding up the ripening process of the pods making the interpretation of the symptoms more difficult.

Only entries C-01-8 and C-01-9 showed a good reaction in the three evaluated stages.

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