PROGRESS OF HALO AND COMMON BLIGHT IN BEAN GROWN AT TEXCOCO, STATE OF MEXICO

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In the Central Highlands of Mexico diseases are important constraints of bean crop, under rainfed conditions the most frequent are the halo blight (*Pseudomonas syringae* pv. *phaseolicola, Psp*) and the common blight (*Xanthomonas campestris* pv. *phaseoli, Xcp*) (1). The halo blight can induce early defoliation and the death of young plants, *Psp* can affect the yield because of seed abortion. On the other hand *Xcp* can reduce the photosynthetic area due to necrotic symptoms and reduce the yield. Both diseases can induce severe damage to the bean plants and reduce the seed quality, as well they can infect the seeds and initiate a new disease when they are sown (2, 3). The objectives of this research were 1) to study the dynamics of the natural incidence of the diseases bean common and halo blight during the crop cycle at the Valley of Mexico, under rainfed conditions and 2) to identify resistant cultivars to both bacterial diseases.

MATERIALS AND METHODS

Eleven bean cultivars, from different origin and contrasting growth habit, were sown on June 10, 2001 at the Valle de Mexico Experimental Station of INIFAP (19° 20' N, 2240 masl and 640 mm of yearly precipitation) at Texcoco, State of Mexico. The cultivars were sown in two rows of 5 m with six replicates per cultivar in a completely random design. Plants of 1 m were tagged when the initial symptoms of halo and common blight appeared and were evaluated at 67, 85 and 99 days after sowing (das). To record the diseases was used a visual severity scale from 1: healthy plant to 9: highly susceptible (4). Incidence and disease severity were recorded in each date previously mentioned; the incidence rate and area under disease progress curve (AUDPC) were also estimated. The data were processed by variance analysis using the MSTATC program, the Duncan mean separation test, and simple correlation coefficients between evaluated variables were calculated.

RESULTS

All cultivars showed incidence of both diseases, that of halo blight was higher than 50% from the end of flowering onwards, and common blight reached the same level until the beginning of seed filling. Not any cultivars reached up six value in the severity scale for both diseases, for halo blight the higher values were for HHL 9438-56, BAT 477 and Chippata Market in contrast for common blight the higher values were for 97 RS 326, HHL 9438-56, DON 38 and 97 RS 303. On the other hand cultivars with halo blight lower values were Bayo Madero, Negro 8025 and Pinto Villa, as well the symptoms of both diseases were delayed to appear. In the case of common blight cultivars DON 1013, Chippata Market and Pinto Villa had the lower scores, all of them belong to Nueva Granada Race.

There was not relationship between disease susceptibility and cultivars growth habit. Seed yield was negatively affected by the development of both diseases and halo blight had a larger negative impact, with a significant negative correlation between yield and halo blight severity (-0.733), halo blight incidence (-0.836) and area under halo blight progress curve (-0.706). The reduction of seed yield varied from 35 to 68% in the cultivars more affected by halo blight.

The AUDPC described with major precision the effect of the diseases on the bean crop, in comparison with punctual readings of incidence and severity. For the halo blight the best cultivars reached 7 to 19% of the higher AUDPC. Tolerant cultivars against both diseases were Bayo Madero, Negro 8025 and Pinto Villa.

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