



CHAPTER 1

INTRODUCTION

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The corn (*Zea mays L.*) is a gramineae belonging to the *Poaceae* family, tribe *Maydeae*, diploid species ($2n=20$), monoecious and allogamous. It is cultivated worldwide between latitudes 58° North and 40° South, distributed in the most diverse altitudes, from locations below sea level until regions with more than 2,500 m of altitude (FANCELLI; DOURADO NETO, 2000). In Brazil, the crop is the second most extensively cultivated, being present in the whole national territory. It is estimated that for the 2016/17 season there will be an increase from 0.8% to 6.4% of the planted area, which in the previous year reached 5,387 thousand hectares. The estimated grain yield for the 2016/17 season will be approximately 83.1 millions tons of grain (COMPANHIA NACIONAL DE ABASTECIMENTO - CONAB, 2016).

High losses in grain yield are associated with the incidence of diseases, several disease monitoring studies have been carried out by Brazilian Agricultural Research Corporation - Maize & Sorghum (EMBRAPA) and by the private sector. These studies have demonstrated that gray leaf spot, southern rust, tropical rust, common rust and corn stunt are among the main diseases of corn (CASELA et al., 2006).

Due to the peculiar characteristics of the crop, such as the size of the plant, extension of the planting area and the economic yield, the use of genetic resistance is more viable for controlling the disease. Although chemical control is currently well accepted in high tech commercial crops, two decades ago it was viable only in seed production fields (GIANASI; CASTRO; SILVA, 1996). The most efficient strategy for disease control in corn is the identification and introduction of resistance genes, aiming at the production of resistant hybrids to most of the diseases that affect corn crop.

With the development of corn inbred lines in Ilha Solteira – SP, it became interesting to check in greater detail the variation in resistance to disease among them. Thus, the objective of this study was to identify resistant and susceptible corn inbred lines based on the stability and adaptability parameters and Area Under the Disease Progress Curve (AUDPC) for disease symptoms of tropical rust (*Physopella zae* (Mains) Cummins & Ramachar.), southern rust (*Puccinia polysora* Underw), gray leaf spot (*Cercospora zae-maydis* Tehon & E.Y. Daniels), northern leaf blight (*Exserohilum turcicum* (Pass.) Leonard & Suggs), physoderma brown spot (*Physoderma maydis*) and phaeosphaeria leaf spot (*Phaeosphaeria maydis* in association with *Pantoeae ananas*). These inbred lines are promising to produce resistant synthetics.

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