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Melero Vara J.M., Diaz R.M.

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J. M. MELERO VARA

Cátedra de Patologia Vegetal - Escuela Técnica Superior de Ingenieros Agronomos - Universitad de Cordoba

R. M. DIAZ

Departamento de Próteccion Vegetal - Dirección General de Investigación Extension Agrarias - Junta de Andalucia - Cordoba

Damping-off of cotton seedling occurs widespread in most cotton growing areas of the world. Even in countries with well developed agricultural technology, crop losses caused by this disease complex stand among the most important due to diseases. In the U.S. crop losses by cotton damping-off average 2.9% over the years 1952-1981, according to the Cotton Disease Council.

For years, cotton seedling damping-off has been considered by the growers as an important problem of the crop in Spain. However, there was a lack of information on distribution, importance and etiology of that complex in our country. We report results of research to determine these aspects of the cotton seedling diseases in Southern Spain.

Systematic disease surveys were carried out in the cotton growing areas of Andalucia during 1980-1984. In this period, we inspected a total of 164 cotton fields randomly chosen. Symptomatic seedlings were sampled from affected fields for isolation of the pathogens involved in the disease complex.

The disease complex occurred widespread over the area surveyed. Symptoms characteristic of post-emergence damping-off were found in 96% of the fields inspected. Also, lack of seedling emergence probably due to seed root or preemergence damping-off was frequently observed. Dead seedlings occurred in 86% of the fields inspected with an average incidence of 8.2%. Incidence of seedling death exceeded 50% occasionally, but it was than 10% most frequently. Average incidence of post-emergence damping-off also varied (6.6 - 9.4%) over the years of surveys. Higher disease incidence occurred in fields where cotton has been grown repeatedly.

Symptoms observed in affected seedlings were similar to those described in different countries, including the occasional death of plants which had developed beyond the seedling stage. In addition, it was relatively frequent to find seedlings with collapsed cotyledons in the absence of roots or hypocotyl lesions. Isolations from these plants rendered a consistent lack of fungal or bacterial growth from affected tissues which suggests an abiotic etiology.

We also found a relatively high frequency of negative isolations from seedlings with the typical symptoms of the disease complex, which again indicates that there is an abiotic component in the etiology of the post emergence damping-off of cotton seedlings in Andalucia.

Pathogenecity tests with fungi isolated from the

affected seedlings, along with their frequencies of isolation, established *Rhizoctonia solani* as the most important pathogen involved in the disease complex. These results agree with most studies on the etiology of cotton diseases in other areas of the world. Most of our isolates of *R. solani*, proved to belong to the anastomosis group 4.

Besides *R. solani*, we found four more fungi to be involved in the etiology of the cotton disease complex, namely *Pythium ultimum*, *Phytophthora palmivore* MF1 A1, *Thielaviopsis basicola* and *Fusarium* spp.

P. ultimum was isolated with low frequency from symptomatic seedlings. We believe that the low frequency does not necessarily implies a minor role of this pathogen in the disease complex, as it could be mainly associated with preemergence damping-off. No isolations were performed from seedlings affected by preemergence damping-off. Furthermore, isolates of *P. ultimum* used in the pathogenicity tests proved able to cause a very minor mortality of the emerged seedlings, but to induce a high incidence of damping-off before the emergence of the host.

P. palmivora was isolated only from two fields in 1984, a year with particularly wet spring. We believe that this fungus is recorded for the first time as a pathogen of cotton seedlings. Isolates of *P. palmivora* proved extremely pathogenic in our tests, indicating that it could be a potentially important component of the complex. These isolates cause a sudden death of the seedlings either before or just after emergence.

T. basicola was isolated with low frequency from affected seedlings. It mainly causes black root and crown root and significant reduction in seedling growth. Seedling mortality was rather infrequent.

Several species of *Fusarium* were isolated with high frequency both from seedlings affected by mild symptoms, as well as from asymptomatic plants. Pathogenicity test showed that most of the *Fusarium* isolated were either nonpathogenic or induced mild symptoms, suggesting every minor role as pathogens of cotton seedlings as it is the case in most situations around the world. However, a limited number of isolates of *F. oxysporum*, *F. solani* and, particularly one isolate of *F. equiseti*, proved to be moderately pathogenic.

Our results indicate that the cotton seedling disease complex is an important constraint for cotton production in Andalucia. In order to develop control measures for this disease complex, it is required detailed information about factors which influence the disease in the complex. That is complicated by the number of pathogens involved. Research on the above aspects is now underway.

Aknowledgment

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