areas. This presentation will discuss some of the most important exotic citrus diseases that have the potential or have already been introduced into the Caribbean area. It also will discuss some criteria that can be used to assess them as to their importance for introduction and establishment. Finally, the importance of budwood certification and education programs to mitigate the spread of these diseases will be presented.

Evaluation of the mitochondrial COI gene as a useful genetic marker for *Myndus crudus* and other *Myndus* spp. J. K. BROWN (1) and M. Dollet (2). (1) Department of Plant Sciences, The University of Arizona, Tucson, AZ 85721 USA; (2) CIRAD, Campus International de Baillarguet, 34398 Montpellier, Cedex 5 France. Phytopathology 97:S174.

In the Americas and Caribbean, the lethal yellowing (LY) phytoplasma causes a disease of palms transmitted by the leafhopper *Myndus crudus* (family, Cixiidae), which may not be the sole vector. In Vanuatu and Ghana LY-like diseases also are rampant in coconut palm but *M. taffini* is thought to be a vector. Recently, high mortality in disease-resistant palms has occurred widely. The availability of a molecular marker would make possible the tracking of distribution and dispersal behaviors of *Myndus* species in relation to epidemic and non-epidemic areas. We employed PCR and mtCOI primers [F-C1-J-2195, R-L2-N-3014] to amplify from DNA extracts a 780 bp fragment. Phylogenetic analysis sorted putative *Myndus* spp. into three main clades: *adiopodoumeensis* (Ghana), *crudus* (Caribbean), and *taffinii* (Vanuvatu), the latter which comprised two sister groups. A fourth *Myndus* spp. from Oaxaca MEX grouped uniquely from other New World collections and herein has been identified as a new, putative vector species.

Polyphenoloxidase and peroxidase induction in the Lulo fruit (*Solanum quitoense* L.) by infection with *Colletotrichum acutatum*. O. CAICEDO and B. Higuera. Univ. Nacional de Colombia, Química, Bogotá. Phytopathology 97:S174.

The anthracnosis caused by *Colletotrichum* is a problem among the Lulo growers and consumers. On the fruit, the illness starts with a black patch on the peel and it extends to the pulp provoking an unpleasant flavor. The behavior of peroxidase POD and polyphenoloxidase PPO on lulo fruits peel, healthy or infected with *C. acutatum*, was evaluated. Methodologies for extraction and activity measure were implemented. We determine that the best extraction buffer system is phosphate 100 mM, PVPP, SDS, using acetone dust. For the activity measure there were established pH 7 and 6,5; 27 and 55°C; substrates cathecol 40 mM and H_2O_2 10 mM plus guaiacol 15 mM, respectively. The enzymes were evaluated for healthy green G, semi mature SM and mature M fruits, finding a progressive PPO increase from G to M, while the major POD activity was found for G fruits, followed by M and SM. Lulos were inoculated (*C. acutatum*) 1×10^5 conidias mL^{-1}) and enzymes were measured. The results showed that it produced an important PPO activation in M fruits after inoculation, then, this enzyme could be related with the fruit-pathogen interaction.

Evaluation of some biochemical responses in resistant and susceptible plants of yam (*Dioscorea* spp.) by interaction with *Colletotrichum gloeosporioides* f. *alate*. L. CERÓN (1), B. Higuera (1), H. Ardila (1), and G. Buitrago (2). (1) Dept. Química; (2) Inst. Biotecnología Univ. Nacional de Colombia, Bogotá. Phytopathology 97:S174.

The yam, a basic and traditional cultivar of the Atlantic Colombian region, has been affected due to the anthracnose disease caused by *C. gloeosporioides*. This fact, and the lack of studies about this model, constitutes a serious limitation for the disease control. We examined the callose content and the peroxidase (POD), polyphenoloxidase (PPO), and beta-1,3-glucanase (GLU) activities in this interaction, using a resistant *D. alata* var. TDA and susceptible *D. rotundata* var. Espino species, and the treatment with elicitors derived from the pathogen in the susceptible var. It was observed that the resistant specie induced biochemical responses as the POD activity and the callose content within 4 h. In contrast, the susceptible exhibited low levels of those parameters. The elicitor application by aspersion induced increased level of GLU and POD while the application by injection induced PPO and callose. This research may postulate the use of fungal elicitor as an alternative that became during to the disease control.

Control of white mold and web blight on lima bean grown for processing. K. L. EVERTS (1,2) and X. G. Zhou (1). (1) University of Maryland, Salisbury, MD 21801; (2) University of Delaware, Georgetown, DE 19947. Phytopathology 97:S174.

Several diseases limit yields of lima and snap beans grown in Maryland and Delaware. White mold (*Sclerotinia sclerotiorum*), which is endemic in coastal regions and along the Delaware Bay, causes yield losses of 20%. Web blight (*Rhizoctonia solani*) also is a frequent cause of discolored seed in lima bean. Fungicides available for management of white mold became limited due to changing U.S. pesticide regulations, and little data existed on efficacy of newly registered alternatives. Multi-year experiments were conducted on the efficacy of reduced-risk fungicides and foliar- and soil-applied biofungicides. The soil-applied biofungicide *Coniothyrium minitans* and the fungicide boscalid reduced the number of white mold-infected pods and increased yields. The fungicides cyprodinil + fludioxonil, fluazinam, and thiophanate-methyl gave an intermediate level of white mold control. Boscalid also reduced the amount of white mold sclerotia and infected pods remaining on the soil surface at the end of the growing season. The biofungicide *Bacillus subtilis* reduced the number of discolored seed, but only in one year.

First report of *Rhizoctonia zeae* in *Cynodon dactylon* in Cuba. MARLENY GONZÁLEZ GARCÍA, Elda Ramos Ramos, y Rebeca Ramírez. Plant Health Institute, Cuba. Phytopathology 97:S174.

Rhizoctonia is a soilborne fungus of considerable importance not only in Cuba but in the world, due to the losses that it causes in several crops, the wide host range and its distribution. In Cuba, the record of species for this genus is poor, due to difficulties with the taxonomic classification. In the last years *Rhizoctonia* occurrence has been increased in the western part of the country, it shows the ability of adaptation to different conditions such as: soil, temperatures and humidity. In the present work it is informed the presence of *Rhizoctonia zeae* causing patches in golf fields sowed with Bermudagrass (*Cynodon dactylon*) in Matanzas. The observed symptoms were necrotic lesions in the stems and leaves. It was achieved the isolation and identification of *Rhizoctonia zeae* in seven of 11 samples tested. The pathogenic tests were carried out and the symptoms were reproduced. This is the first report of this species as causal agent of patches in bermudagrass, and olso *C. dactylon* is a new host for *R. zeae* in Cuba. Keywords: *Rhizoctonia zeae*, *Cynodon dactylon*, patches.

The complete sequence of the *Cytoplasmic citrus leprosis virus* (CCLV) and its genome organization. A. S. GUERRA (1), K. L. Manjunath (2), R. H. Brlansky (1), and R. F. Lee (2). (1) University of Florida, Plant Path Dept., CREC, Lake Alfred, FL 33850; (2) USDA ARS, Riverside, CA 92507. Phytopathology 97:S174.

Leprosis, an emerging invasive disease of citrus in Central America, has been present in South America for several years. Leprosis does not occur in the U.S. or the Caribbean Islands, but these regions are threatened by the disease. We have described the association of a bipartite, positive-sense RNA virus associated with the cytoplasmic citrus leprosis. The CCLV RNAs were identified from a cDNA library created from citrus naturally infected with the cytoplasmic leprosis disease from Panama. Here we report the complete sequence of the CCLV bipartite genome. RNA 1 possesses two open reading frames (ORFs). ORF 1 in RNA 1 encodes a putative 276 kDa polyprotein containing domains similar to the Sindbis-like virus super group having putative methyltransferase, cysteine protease, RNA helicase and RNA dependent RNA polymerase motifs. ORF 2 in RNA 1 shows no similarity with other sequences in the Genbank. RNA 2 has three ORFs. While ORFs 1 and 3 of RNA 2 show no similarity with sequences in the Genbank, ORF 2 encodes a putative 30.6 kDa viral movement protein.

Infectivity of *Merremia mosaic virus* clones: A bipartite begomovirus from Puerto Rico. A. M. Idris (1), J. Bird (2), and J. K. BROWN (1). (1) Department of Plant Sciences, The University of Arizona, Tucson, AZ 85721 USA; (2) College of Agricultural Sciences, University of Puerto Rico, Rio Piedras, PR 00928. Phytopathology 97:S174.

Merremia mosaic virus (MeMV) is a bipartite begomovirus (family, Geminiviridae). MeM disease symptoms and its transmissibility by *B. tabaci* were reported by Bird (~1958) from indigenous *Merremia quinquefolia* and *M. aegyptia* in Puerto Rico (PR). Until now, the MeMV DNA-A and -B components had been cloned only from symptomatic tomato from PR. Total DNA extracted from symptomatic tomato plants, and from leaves of *M. quinquefolia* and *M. aegyptia* weeds were used in rolling circle amplification (RCA) to obtain full-length genome-size fragments (~2.6 kbp). Based on the PR tomato isolate sequence, unique restriction sites were identified to enable cloning the DNA-A (Hind III) and DNA-B (Nco I) components. The DNA sequence was determined for the A (2557 bp) and B (2492 bp) component, which each shared >98% identity with MeMV-tomato components. Clones were biolistically inoculated to tomato and *M. quinquefolia* and symptoms that developed (14 days PI) were indistinguishable from those of natural infections.

Papaya ring spot virus affects tomato plants in west Mexico. J. L. MARTÍNEZ, P. Posos-Ponce, C. M. Duran-Martínez, and J. Santillán-Santana. Universidad de Guadalajara, CUCBA, Zapopan, Jalisco, México. C.P. 45110. Phytopathology 97:S174.

Various laboratory and field studies were conducted in 2003 and 2004 with the objective of determining the incidence and distribution of Papaya Ring