

**2005 International Institute of Tropical Forestry
USDA Forest Service**

PROJECT TITLE:

**Integrated Disease Management (IDM) of Shrubs, Trees
and Ornamentals in the Urban Landscape**

Abstract: In Puerto Rico, urban landscape management is mainly by the use of large quantities of pesticides. This contributes to pollution of water, danger to human health and other organisms, and disruptions of ecological balances. The use of Integrated Disease Management (IDM) practices for maintaining attractive trees and ornamentals is mandatory. Early disease detection, combined with rapid diagnosis is a prerequisite to successful **IDM**. Diagnosis can be difficult unless we know the history of the environmental conditions and cultural practices. Rapid diagnosis will permit the selection and timely application of control procedures before the disease becomes unmanageable. An effective quarantine program will prevent the transfer and spread of pathogens into nursery and field forestation areas. This proposal requests \$40,000 in federal funds to develop educational materials about common diseases and IDM of trees and ornamentals in urban environments. The main objective of the proposed project is to produce two field guides, one about IDM of shrubs and trees in the urban landscape and one about IDM of ornamentals in nurseries, with an electronic presentation for each of the topics covered. The design and development of these educational resources will assist agricultural educators in training landscapers and homeowners to understand and implement effective and environmentally responsible disease management strategies for the protection of urban vegetation. The outcomes of this project will lead to minimize the impacts of the landscape maintenance on the urban environment, and to reduce the potential for disease problems on trees, shrubs and ornamentals in landscape.

PROJECT DURATION: 2006-2010

PROJECT DIRECTOR:

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Integrated Disease Management of Shrubs, Trees and Ornamentals in the Urban Landscape

JUSTIFICATION

Puerto Rico is experiencing unprecedented rates of urban and industrial development. The National Resource Inventory of the United States Department of Agriculture indicates that between 1992 and 1997, Puerto Rico lost approximately 12,460 acres per year of agricultural and open land. Such accelerated development triggered a boom of the landscape maintenance industry. The sector includes approximately 1,500 pest control operators (PCO's), and 1,000 landscapers. Approximately 80% of landscapers and their employees do not know how to monitor and diagnose key disease problems in urban landscape.

Trees, shrubs, and ornamentals in a landscape setting are subject to stresses, are often planted in disturbed soils, may not be adapted to the local climate, or may be exposed to poor cultural management practices. The stresses associated with growing them under less than ideal conditions and adverse environmental conditions and cultural practices can cause biotic and abiotic diseases. Abiotic diseases are non-infectious, are responsible for more than 85 percent of the plant disorders and can predispose plants to attack by pathogens and insects.

Dealing with diseases of plants in their natural habitat or outside involves the understanding of all facets of plant health management. Infectious plant pathogens, including phytoplasmas, viruses, bacteria, fungi and nematodes cause plant health problems. Diseases occur when a pathogen disrupts the normal processes of a plant with detrimental consequences for the plant's health. Diagnosing plant problems can be a difficult task, because usually they arise from different factors.

The training program and educational materials will lead to increased awareness of the effect of diseases in landscape vegetation and integrated management methods available for control. IDM programs are designed as an integral part of forest pest management, including both prevention and control strategies. The adoption of integrated disease practices effectively

reduces the potential for disease problems, is environmentally responsible and economically practical.

By having updated information on integrated disease management posted in the Forest Health Management web page allow to respond to specific needs of the professional personnel working with management of shrubs, trees and ornamentals in landscape.

Extension agents and other agricultural educators in Puerto Rico need more complete and ready to use educational materials to teach environmentally responsible pest management strategies for the protection of urban vegetated areas.

OBJECTIVES

The goal of this project is to promote the adoption and implementation of effective strategies to reduce the potential for disease problems on shrubs, trees and ornamentals and to respond to specific needs of the professional personnel working with landscape management. The objectives of this proposal are the following:

1. Create two field guides, one about integrated disease management on shrubs and trees and one about integrated disease management of ornamentals in nurseries, and prepare electronic presentations for each of the topics covered in the field guides. Educational materials will assist agricultural educators in training arborists, landscapers, and homeowners to understand and implement IDM. The power point presentations will include information on:
 - General Principles of Plant Health Management
 - Diagnosing and Monitoring Diseases
 - Common Diseases of Shrubs and Trees in Landscape
 - Common Diseases of Ornamentals in Nurseries
 - Integrated Disease Management
 - Fungicides for Controlling Common Diseases of Shrubs and Trees in the Landscape
 - Fungicides for Controlling Common Diseases of Ornamentals in Nurseries
 - Fungicide Application and Safety

2. To publish the information about IDM of shrubs, trees and ornamentals in the Forest Health Management web page.

APPROACH AND PROCEDURES

Objective 1- The director and collaborators of this project will compile and integrate the information needed to create the field guides about IDM in shrubs and trees, and IDM in ornamentals in nurseries. They will develop an electronic presentation with its corresponding script for each of the topics covered in the guides.

Once these materials are complete, the director and collaborators of this project will offer five trainings for agricultural educators and personnel of the Department of Natural and Environmental Resources to present the information contained in the field guides and electronic presentations. A register of educational materials recipients will provide for subsequent evaluation purposes and future educational activities.

Objective 2- To publish the information about IDM of shrubs, trees and ornamentals in the Forest Health Management web page. The availability of information online will encourage landscapers, and other professionals to adopt IDM strategies and make appropriate decisions when handling disease problems. Special instructions will be delivered to the clientele in the use of the information that will be available online.

EVALUATION

A survey prior to initiation of the training and immediately after its completion among training participants will evaluate their knowledge and attitudes about IDM. This survey will also determine if the participants include any IDM information in their recommendations to arborists, landscapers, homeowners and growers. In particular, this survey will determine whether participants learned how to implement an IDM program on shrubs, trees and ornamentals and if they are able to orient landscapers, homeowners or other individuals in environmentally sound responsible disease management strategies.

KEY PERSONNEL

Project Director

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Major Collaborators

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The director and collaborators have expertise in all the areas needed for project development and implementation. They have excellent professional relations and frequently work together as a team in extension and research activities. They are seriously concerned and committed with sustainability in agriculture and forestry.