

DISEASE SCREENING AND POST-ENTRY QUARANTINE PROGRAM FOR SAFE INTRODUCTION OF SUGARCANE VARIETIES IN THE PHILIPPINES

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ABSTRACT

A three-year post-entry quarantine pathogen testing protocol for foreign sources of sugarcane was developed for the Philippines. A total of 284 varieties acquired from Australia, Bangladesh, China, France, Indonesia, Malaysia, Mauritius, Thailand, USA, Japan, Vietnam and Pakistan were subjected to pathogen testing inside the post-entry quarantine glasshouse for 24 months at the Institute of Plant Breeding – College of Agriculture and Food Science, University of the Philippines Los Baños and another 10 months under the open-field conditions at Guimaras, Visayas for the period of 2001-2012. Leaf scald, ratoon stunting disease and sugarcane mosaic were among the most common diseases that were detected on foreign varieties imported from Thailand, Malaysia, Indonesia, Bangladesh, China, France, USA, Vietnam and Pakistan. The presence of other diseases such as smut, red rot, grassy shoot, sheath rot, Pokkah boeng and yellow leaf disease were also observed on some foreign varieties from Thailand, Indonesia, China, Australia, USA and Pakistan. A cold soak and hot water treatment was found effective in eradication of pathogens associated with seed pieces received from foreign countries. Furthermore, the use of an optimized and standardized scheme of quarantine pathogen testing through antibody and nucleic acid based assays proved to be a reliable practice in checking the introduction of new pathogens in new and promising sugarcane varieties received from other countries. These preliminary quarantine practices were found effective in protecting the Philippine industry from unwanted quarantine pathogens.

Key words: pathogen testing, antibody, nucleic acid, cold soak and hot water treatment

INTRODUCTION

Introduction of foreign germplasm increases the genetic diversity and desirable agronomic traits (Croft, 1996). As a result of sugarcane germplasm exchange and plant breeding, sugarcane varieties that are high yielding, adapted to changing environmental conditions, and resistant to pests and diseases can be developed. Sugarcane (*Saccharum* spp. hybrid) is the major crop cultivated in the Western Visayas (Moog, 2006) and is an important cash and exportable crop in the Philippines along with coconut, pineapple, banana, coffee and mango (Espino and Atienza, 2001). The Philippines is second in terms of sugarcane production in Southeast Asia (ASEAN Food Security Information System, 2014). The feasibility of sugarcane as a source of special sugars, bio-plastics, bio-fertilizers, among other products, is also being studied to further increase its input to the Philippine economy (www.sra.gov.ph).

In the Philippines, diseases have always been a major biotic constraint in sugarcane production. About 75-100% loss of sugarcane yield has been recorded in fields when cuttings infected by *Sporisorium scitamineum* syn. *Ustilago scitaminea* are planted (Reyes *et al.* 1980). In addition,