

–Title font type for the main title is Bookman Old Style, size 13, bold, centered

Anthropogenic and Environmental Factors Driving the Emergence of Plant Eids and Their Mitigation Measures

Provide 2 spaces in between title and authors' names

Fonts for the authors' names should be in Bookman Old Style type, size 10, centered. Author's name, job title, affiliation, and Corresponding author(s) email address(es) should be provided.

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There should be 1-3 spaces in between authors' names and Abstract

ABSTRACT

Abstract should always be capitalized, Franklin Gothic Medium Condensed font type, size 12, bold centered

Abstract text should always be in italics. If there are scientific names in the abstract text, this should be changed to Arial 9 to distinguish them from the rest of the text.

*The potential risk of a crop disease can be determined by considering the three components of the “disease triangle” that may combine to cause its occurrence: pathogen, host, and environment. An outbreak of a crop disease requires the presence of a virulent pathogen in sufficient quantity to initiate infection, the presence of a susceptible host for the pathogen to infect. In Western Canada, the emergence of the three high profile diseases, Verticillium wilt of alfalfa (*Verticillium albo-atrum*, Vaa) in the late 1970s, bacterial wilt of bean (*Curtobacterium flaccumfaciens* pv. *flaccumfaciens*, Cff) in the late 1990s, and white mold of bean (*Sclerotinia sclerotiorum*, Ss) in the late 1980s, was mainly due to production of these crops under irrigation. Since Vaa and Cff are quarantine pathogens in Japan, Taiwan and China, and Ss is a quarantine pathogen in Japan, the focus of this review is to discuss measures to prevent introduction and spread of these high profile pathogens in Asian countries.¹*

The keywords should be Arial, size 9, normal, flash left, words which are proper nouns should have capital letter at the start

Keywords: Emerging Infectious Disease (EID), anthropogenic, epidemiology, irrigation, disease control

Also called header 1: Franklin Gothic Medium Condensed Font, bold, size 12, centered

First paragraph should not be indented. Indention starts from the second paragraph onwards.

INTRODUCTION

The body text should be in New Times Roman font, size 10, justified

The term “anthropogenic” designates an effect caused by human activity. There are numerous examples of anthropogenic sources related to agriculture, including anthropogenic pollution of air, soil and water by

¹ China entered a new stage of urban and rural develop-ment. As part of the reform for the national economy and farmers, the 2000 reform of rural taxes and fees was intended to reduce and simplify the burden on farmers.

chemical pesticides and/or chemical fertilizers, anthropogenic soil salinization due to inadequate drainage of ground water, and anthropogenic plants developed by the human alteration of plants through breeding, selection, genetic engineering and tissue fusion.

Header 1, Franklin Gothic Medium Condensed font, bold, size 12, centered

ANTHROPOGENIC IMPACTS OF EIDs

Emergence and resurgence of the once limited geographic and host ranges of infectious diseases are largely spurred by anthropogenic factors. The anthropogenic impacts on the three components of the “disease risk triangle” are further discussed below.

The potential risk of an Emerging Infectious Disease (EID) in crop(s) can be determined by considering the three components, pathogen, host, and environment, in the “disease triangle.” An outbreak of a crop disease requires the presence of a virulent pathogen

Table texts should be in Arial fonts (to be changed to Universe fonts in the InDesign software), size 10.
The footnotes should be Times New Roman 8. Scientific names should be in italics

Table 1. Bacterial wilt (Cff) in irrigated fields of common bean (*Phaseolus vulgaris*) in Alberta^a.

Year	# Fields surveyed	# Fields with BW	(%)	Reference ^b
2001	50	37	74	CPDS 83: 90
2002	58	35	60	CPDS 84: 88
2005	9	9	100	CPDS 87: 107
2007	28	15	54	CPDS 88: 99
2009	25	11	44	CPDS 90: 121

^aBacterial wilt of common bean caused by *Curtobacterium flaccumfaciens* pv. *flaccumfaciens* (Cff) was first discovered in commercial seed lot of bean crops grown in southern Alberta in 2001 (Hsieh *et al.* 2002). All common beans are grown under irrigation in Alberta.

^bCPDS = Canadian Plant Disease Survey.

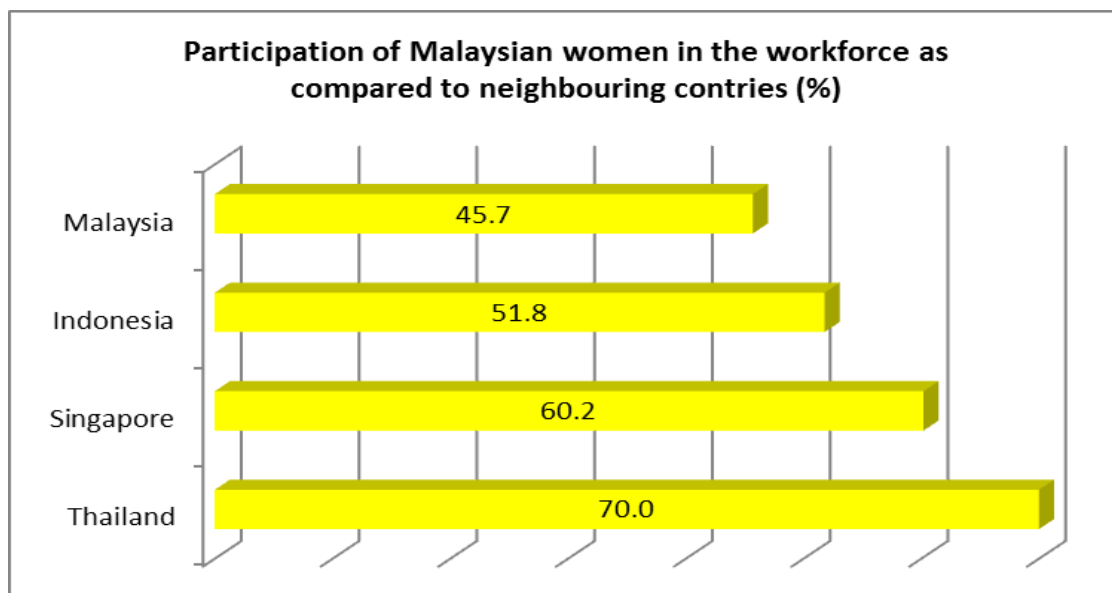


Figure 1: Participation of Malaysian women in the workforce

Source: Economic Planning Unit, Malaysia (2013)

Since *Vaa* and *Cff* are quarantine pathogens in Japan, Taiwan and China, and *Ss* is a quarantine pathogen in Japan, the focus of this review is to discuss the effects of some anthropogenic factors and epidemiological factors on the emergence and spread of crop diseases caused by these pathogens in North America as well as measures to prevent introduction and spread of these high profile diseases in Asian countries.

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ANTHROPOGENIC IMPACTS OF EIDS

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Header 2 are the subheads. Times New Roman font, size 11, bold, flash left, not capitalized

Pathogen (Source of inoculum)

In the body text, all *et al.* should be in italics as well as the scientific names.

Presence of a virulent pathogen is a prerequisite for the outbreak of a plant disease. Introduction of a plant pathogen into a new geographic region is largely by anthropogenic factors such as commercial seed trades or exchange of germplasms (Heale *et al.* 1979). For example, Verticillium wilt of alfalfa (*Vaa*) has long been considered a major disease of this forage crop in Northern Europe since the first report in Sweden in 1918 (Raynal and Guy 1977).

Versatility of a pathogen is another important factor affecting the ability of EIDs to spread in a field or a region. For example, spores of *Vaa* produced on diseased alfalfa plants can spread by various means, including weather factors (wind, rain splashes or irrigation water), farm implements and insect vectors such as pea aphids (*Acyrtosiphon pisum*), alfalfa weevils (*Hypera postica*), grasshoppers (*Melanoplus sanguinipes* and *Melanoplus bivittatus*), and leafcutter bees (*Megachile rotundata*) (Huang 2003).

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Host plants

Another anthropogenic impact on the emergence and epidemic of a plant disease is presence of susceptible host cultivars. The potential threat of an EID is often overlooked by producers as they are more interested in growing crop cultivars that are high yielding and high quality for economic reasons. Thus, plant breeders will focus their breeding efforts mainly on the development of new cultivars with improved yield and quality and ignore the potential threat of an EID which is newly introduced into the country or the crop production region.

CONCLUSION

The emergence and resurgence of an infectious crop disease is a result of interactions of the three components (pathogen, host and environment) in a “disease triangle.” The outbreak and expansion of a once limited geographic distribution and narrow host range pathogen are largely spurred by anthropogenic factors (or human activities) affecting these biological (pathogen and host) and abiological (environment) components. This review focused the discussion on anthropogenic factors and epidemiological factors affecting the emergence of three high profile diseases in North America (Verticillium wilt of alfalfa, *Vaa*; bacterial wilt of bean, *Cff*; and Sclerotinia white mold of bean, *Ss*).

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REFERENCES

1. Reference shall follow the guidance and principles of APA (American Psychological Association)
2. Listed references shall be in alphabetical order. Each listed Reference shall be cited in text, and each text citation shall be listed in the Reference section.