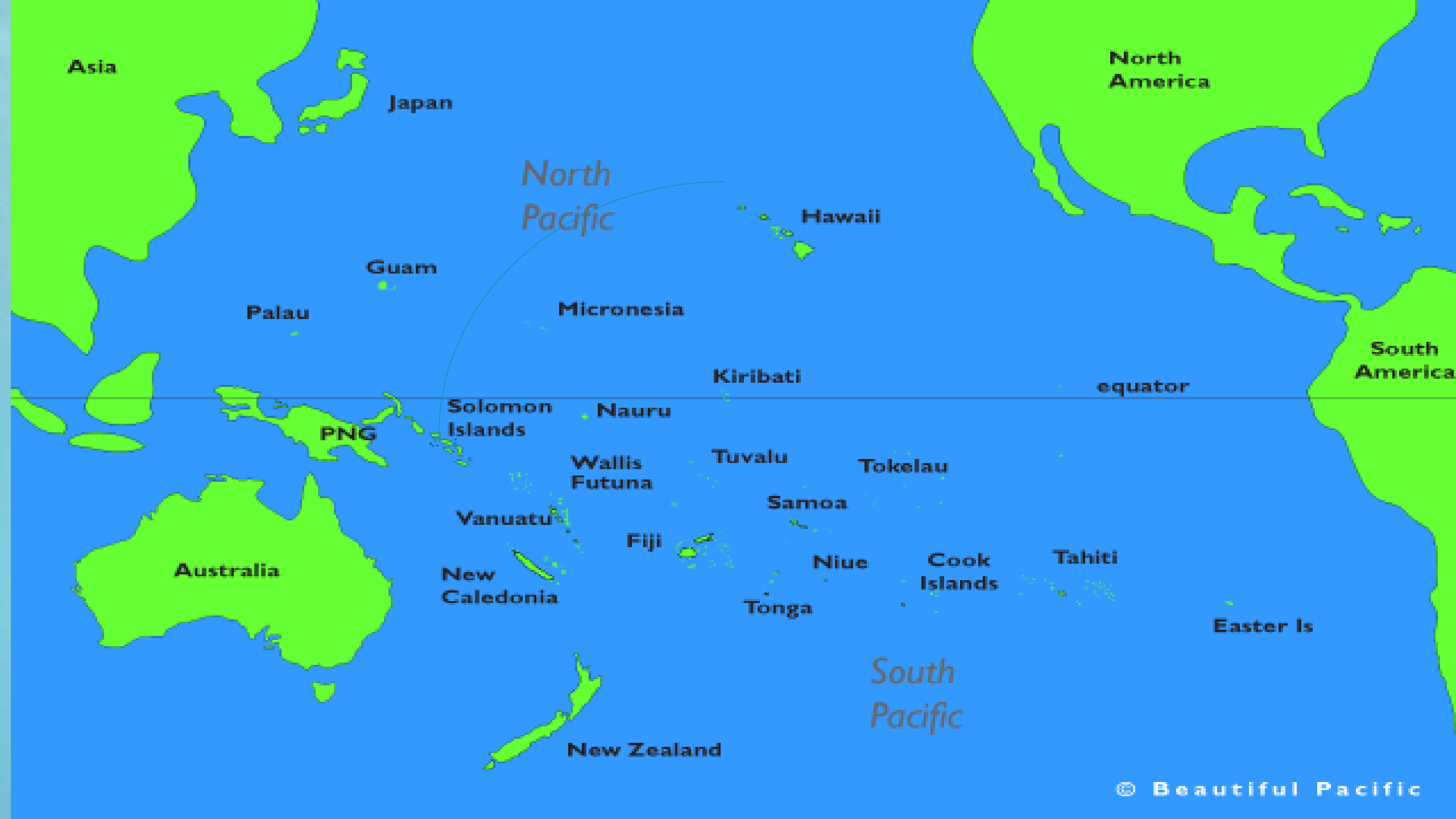
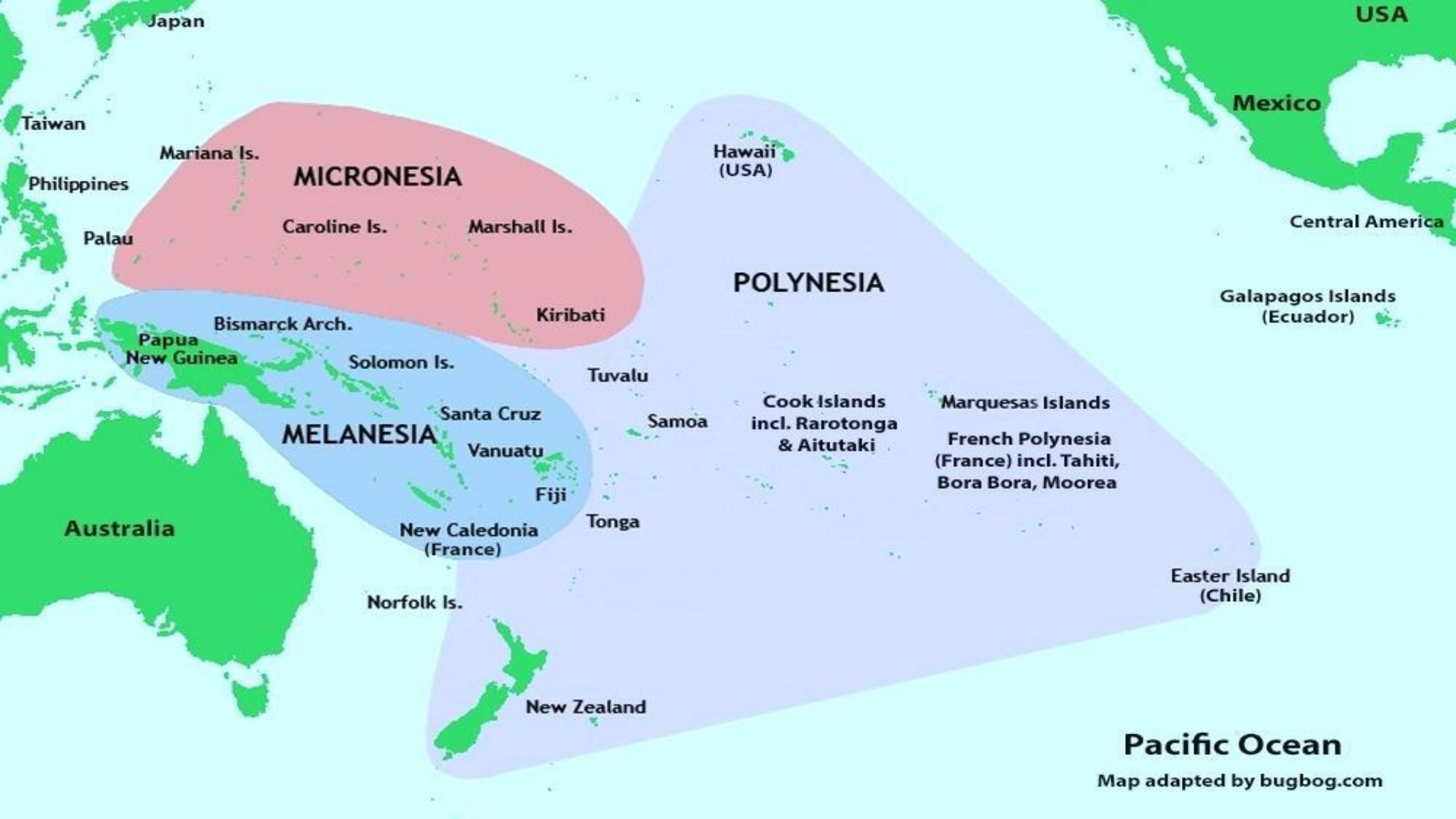
# Climate Change impacts on Plant Health in the Pacific Islands

# Brief Introduction

- South West Pacific comprises of 22 pacific Island countries and territories scattered over 40 million sq kms ocean
- Populations range from 1400 – Tokelau to 20 million plus Australia
- Areas range from 10 sq km (Tokelau) to 7.7 million sq km Australia
- Total population (excluding Aust and NZ): app 13.6million
- Over 1000 languages + dialects
- Grouped into Melanesia, Micronesia, Polynesia
- Popular tourist destinations


Asia
Japan
North America
North Pacific
Hawaii
Guam
Palau
Micronesia
South America
Kiribati
equator
Solomon Islands
Nauru
PNG
Wallis Futuna
Tuvalu
Tokelau
Samoa
Vanuatu
Fiji
Australia
Niue
Cook Islands
Tahiti
New Caledonia
Tonga
Easter Is
South Pacific
New Zealand
© Beautiful Pacific


Japan
USA
Mexico
Taiwan
Mariana Is.
MICRONESIA
Philippines
Hawaii
(USA)
Caroline Is.
Marshall Is.
Palau
Central America
POLYNESIA
Galapagos Islands
(Ecuador)
Kiribati
Bismarck Arch.
Papua
New Guinea
Solomon Is.
Tuvalu
Cook Islands
incl. Rarotonga
& Aitutaki
Marquesas Islands
Santa Cruz
MELANESIA
Samoa
French Polynesia
(France) incl. Tahiti,
Bora Bora, Moorea
Vanuatu
Fiji
Tonga
Australia
New Caledonia
(France)
Easter Island
(Chile)
Norfolk Is.
New Zealand
Pacific Ocean
Map adapted by bugbog.com


Kiribati


Marshall Islands
© picture-alliance/AP Photo/U.S. Army


Tuvalu

# Biodiversity

- Holds 3 of the 35 Global hotspots
- > 400 endemic bird species
- Approx 30% of native plant species are endemic
- Vascular plants : Approx 70% of New Caledonia (approx. 3,371species), 80% PNG
- Endemic but in small numbers due to size and isolation of islands


# AGRICULTURE

# agriculture

- Affects 90% livelihoods in the Pacific Islands
- 15-20% Tonga’s economy
- Food security, Health, Trade
- Traditional crops:  root crops taro, yams, cassava, sweet potato,

# Traditonal Rootcrops

Taro (*Colocasia esculenta)*



Yams (*Discorea alata)*

# Traditional Rootcrops

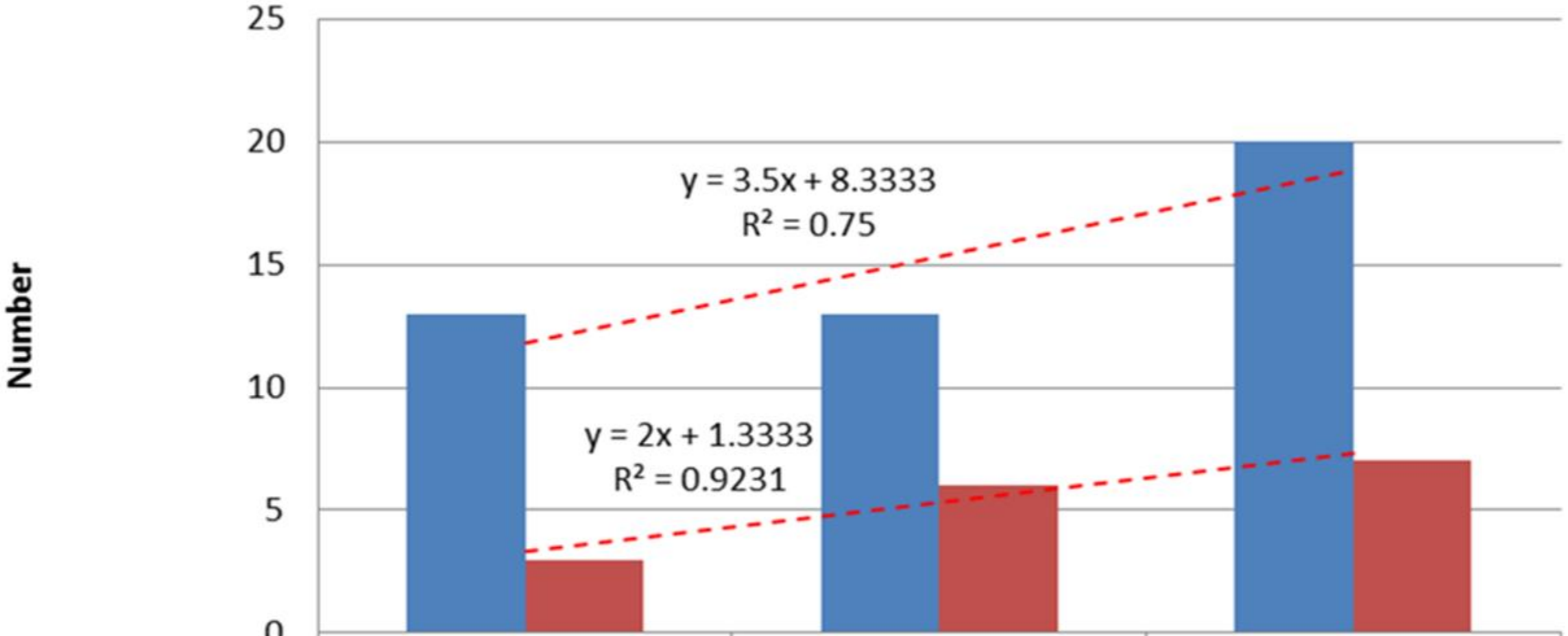
Cassava (*Manihot esculenta)*

Sweet Potato – *Ipomea batatas*

# Climate change related impacts:

- Types of climate change activities-cyclones, el nino, heavy rain – flooding, rising sea levels, rising temperatures
- Cyclones – increasing severity, intensity and frequency
- El nino – prolonged drought
- Rising sea levels
- Rainfall - floods

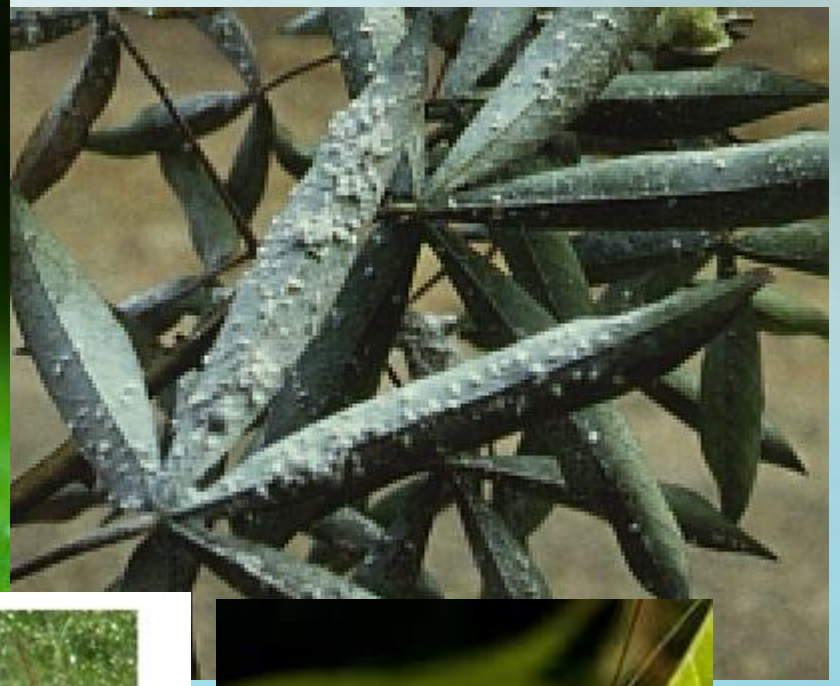
# No of Tropical Cyclones that have affected Tonga by decade




| | 80/81-89/90 | 90/91-99/00 | 00/01-09/10 |
|---|---|---|---|
| No of TCs | 13 | 13 | 20 |
| No of Severe TCs | 3 | 6 | 7 |

# Cyclone Ian – Ha’apai Isla

# Spiralling whitefly (*Aleurodicus dispersus)*





# Cyclone Gita 2018

- **Catergory 1 – Samoa – Flooding and fallen vegetation**
- **February 12**
- **Catergory 4 – Tongatapu, Eua -**
- **February 13**
- **Catergory 5 – Lau group of Fiji, Heavy Floods rest of Fiji.**

# Transboundary movement:
# Taro leaf blight (*Phytophthora colocasiae*)

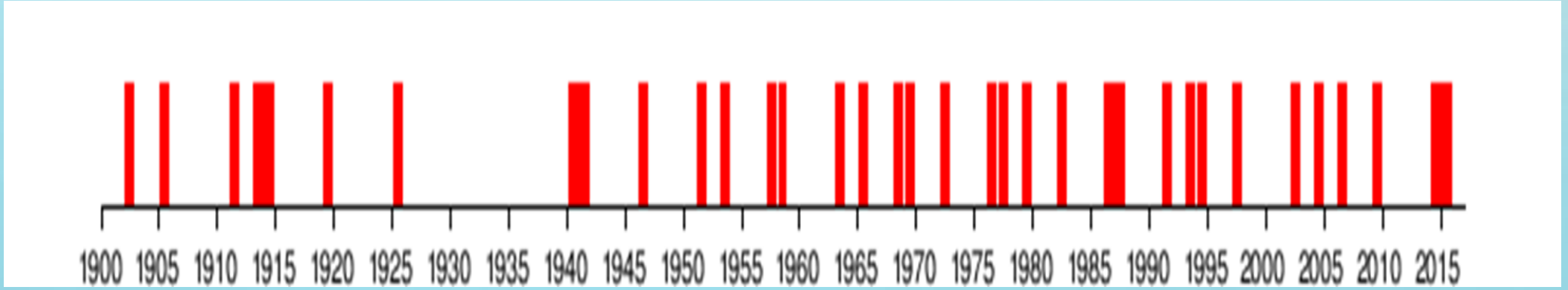
# Myrtle rust (*Austropuccinia psidii)*– New Zealand

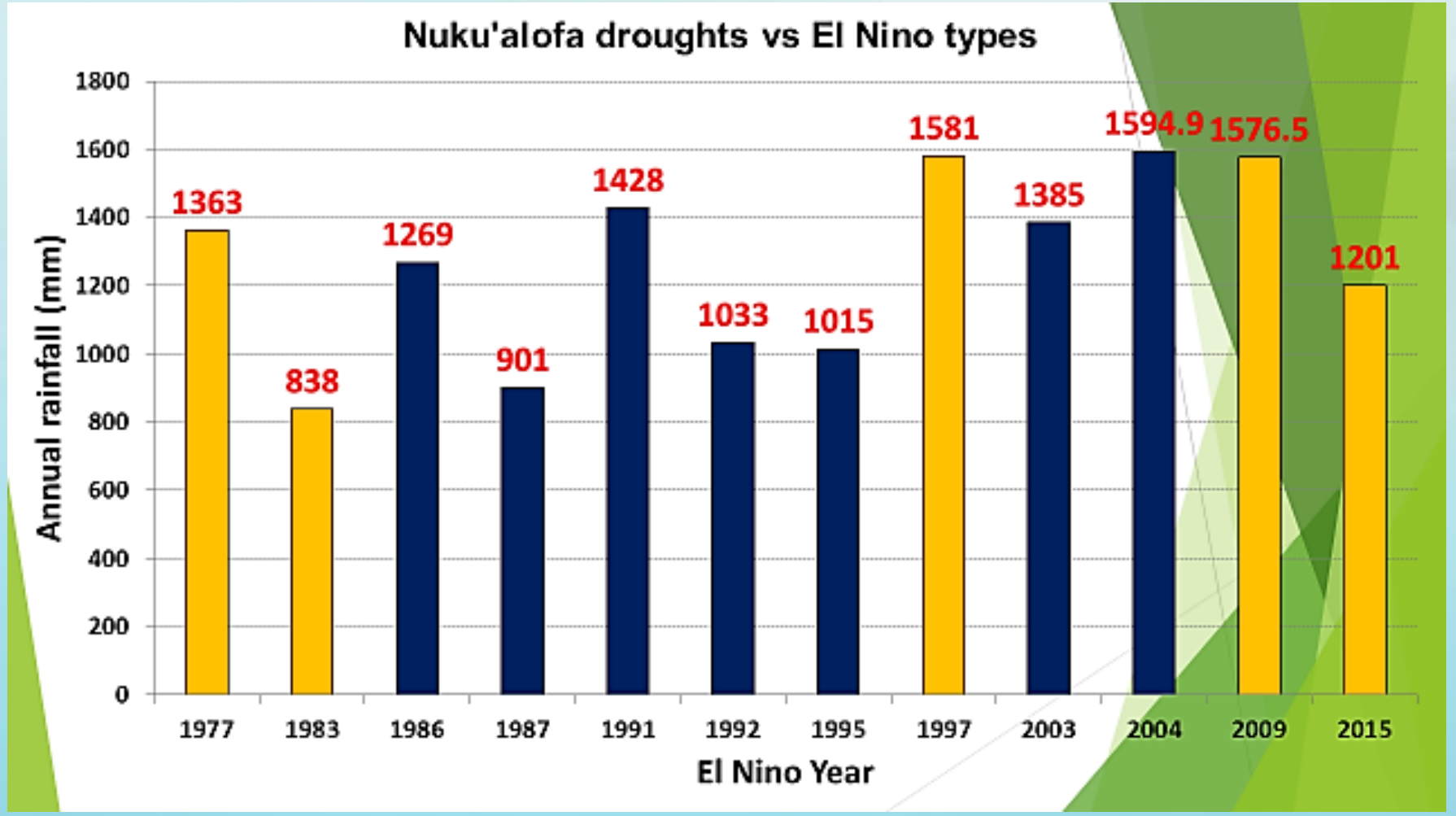
http://www.mpi.govt.nz/protection-and-response/responding/alerts/myrtle-rust/

Fungi attacks plants belonging to Myrtaceae family.  Evidence supports wind deposited from Australia.

# El Nino

warming of the ocean surface or above-average sea surface temperatures in either the central and eastern tropical Pacific Ocean. This warming causes a shift in the atmospheric circulation with rainfall becoming reduced over Indonesia and Australia, and southern pacific islands while rainfall and tropical cyclone formation increases over the northern tropical Pacific Ocean




Nuku'alofa droughts vs El Nino types
Annual rainfall (mm)
1800
1600
1400
1200
1000
800
600
400
200
0
1363
838
1269
901
1428
1033
1015
1581
1385
1594.9
1576.5
1201
1977
1983
1986
1987
1991
1992
1995
1997
2003
2004
2009
2015
El Nino Year

# El nino 2015 - prolonged drought

Pink Wax Scale
(*Ceroplastes rubens*)

*Anicetus*

*Chilicorus* sp.

# White peach scale –cassava ( *Pseudaulacaspis pentagona*)

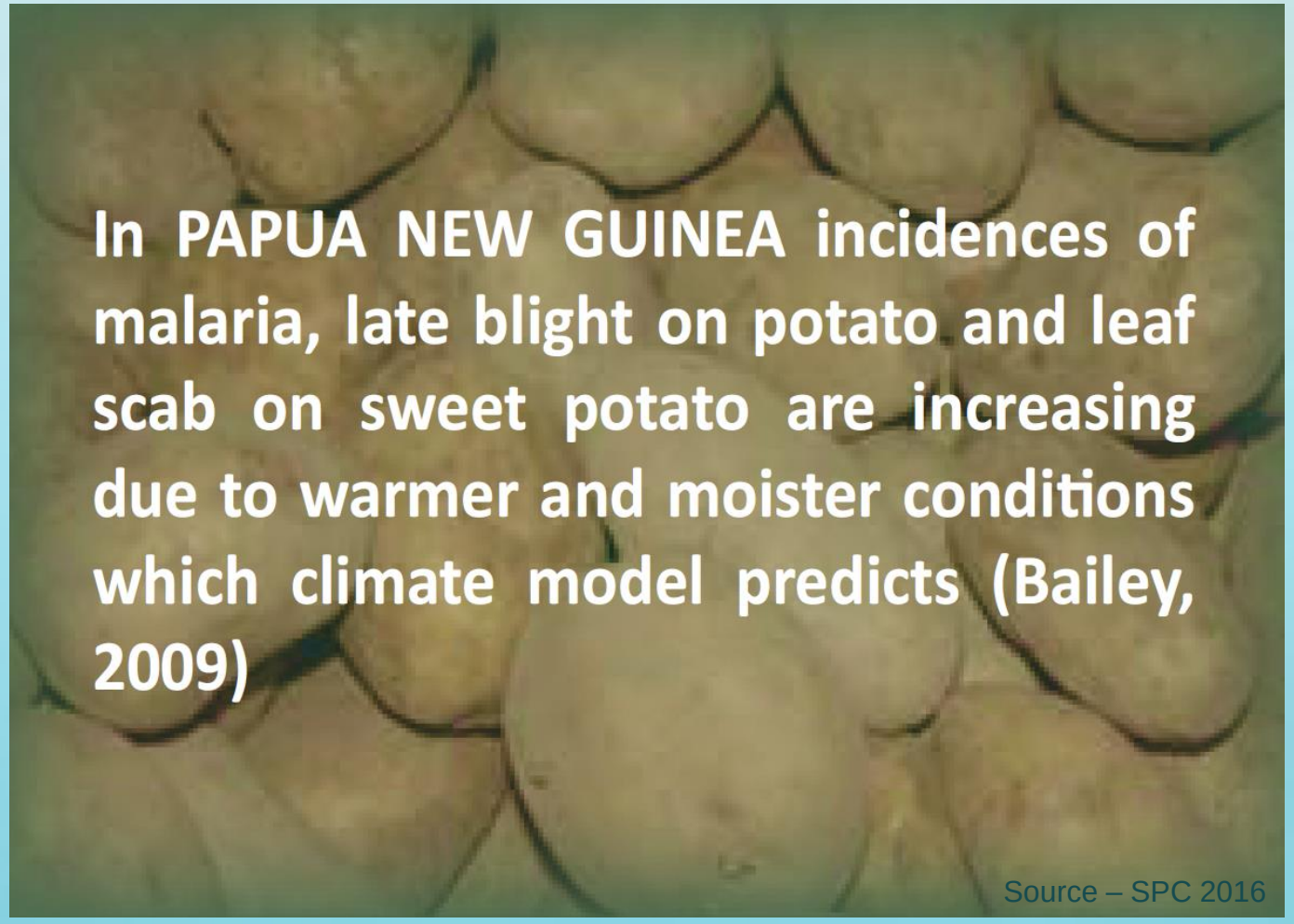
# El Nino Impacts.

- Stressed plants
- Pest outbreaks – due to reduced population/absence of natural enemies
- Huge decline in agricultural production
- Huge decline in exports

# Effects of rainfall change on crop production


Source – SPC 2016

# Effects of warmer temperatures




Source – SPC 2016

# Summary of impacts

- Pest and disease outbreaks due to cyclones, el nino,
- Transboundary movement of pests and diseases due to storms/cyclone activity
  - Pathogens
- Movement of pests and diseases to warmer temperatures.
- Food security
- Suspension of trade / loss of markets
- Huge impacts on biodiversity

# Urgent Actions required

- International Year of Plant Health 2020/Healthy Plants for a sustainable planet
- More data on CC impacts on agriculture across the region
- Need to address CC impacts at the community level
- CC impacts on Invasive species
- Lack of much needed scientific data on CC impacts on biodiversity in the region
- Increase in co-ordinated efforts with all stake holders in mitigating impacts environment and agriculture.

# Malo aupito