

SURVIVING THE RAVAGES OF INVASIVE PEST : A FARMERS DILEMMA IN CAMERON HIGHLANDS

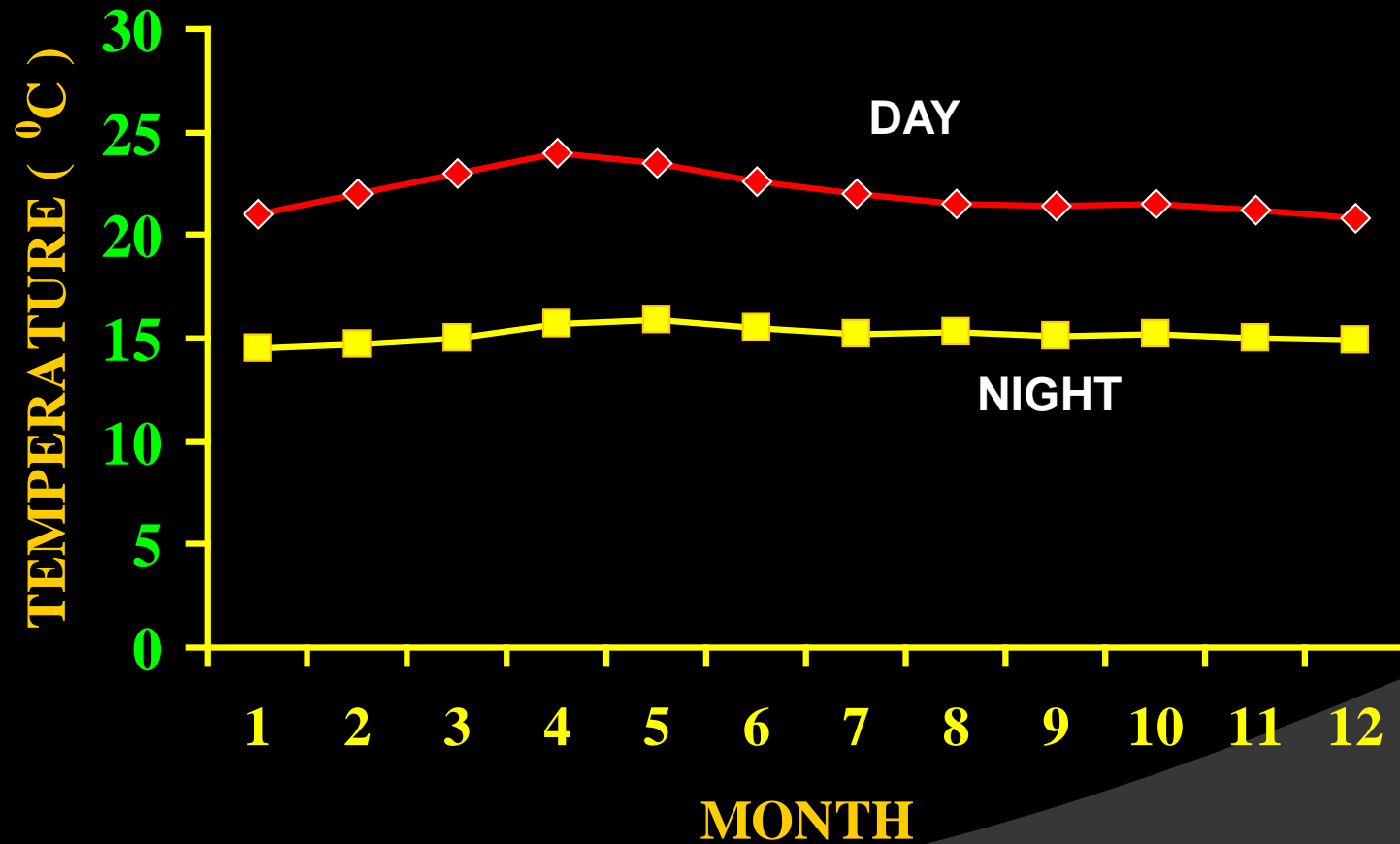
SYED A.R



**1000M – 1500M
ABOVE SEA LEVEL**



MEAN MAX & MIN TEMPERATURE FOR CAMERON HIGHLANDS



MEAN MONTHLY RAINFALL OF CAMERON HIGHLANDS



CAMERON HIGHLANDS AGRICULTURE

TOTAL AREA **712 SQ KM**

➤ **TEA** **3500 HA**

➤ **VEGETABLES** **3000 HA**

➤ **ORNAMENTALS** **1000 HA**

➤ **FRUITS** **40 HA**

➤ **TOTAL** **7540 HA**

TOTAL NO OF FARM FAMILIES– 2500



I AM FARMER IN CAMERON HIGHLANDS

- **VEGETABLES**
- **STRAWBERRIES**

FARMING FOR 25 YEARS

SYED ABD RAHMAN

WHAT DO I GROW ?

- ◎ CABBAGES
- ◎ TOMATOES
- ◎ BELL PEPPERS
- ◎ FRENCH BEANS
- ◎ CHILLIES
- ◎ LETTUCE
- ◎ STRAWBERRIES









OPEN CULTIVATION VS PROTECTIVE CULTIVATION

- ◎ **SHIFT FROM OPEN TO PROTECTIVE CULTIVATION IN PAST 15 YEARS**
- ◎ **NEW PEST PROBLEMS ENCOUNTERED**
- ◎ **RESULTED IN INCREASE PESTICIDE APPLICATION**
- ◎ **POLLUTION PROBLEMS**

SHIFT IN METHOD OF CULTIVATION

- ◎ NEW PEST
- ◎ PEST OUTBREAKS
- ◎ MINOR PEST BECOME MAJOR PEST
- ◎ PESTICIDES NOT EFFECTIVE
- ◎ NEED HIGHER EFFICACY





MAJOR PEST (INVASIVE SPECIES)

- ◎ TWO-SPOTTED RED SPIDER MITES
- ◎ THRIPS
- ◎ WHITEFLIES
- ◎ LEAFMINERS
- ◎ APHIDS
- ◎ LEPIDOPTERA

MITES

➤ Two spotted red spider mites (*Tetranychus urticae*)

- Attacks vegetables, ornamentals and strawberries

Symptoms :

- Leaves turn yellow with bronzed or brown areas
- Infested plants generally stunted and crinkled

TWO-SPOTTED RED SPIDER MITE



THRIPS

- ◎ **Western flower thrips (*Frankliniella occidentalis*)**
- ◎ **Onion thrips (*Thrips tabaci*)**
 - **Attacks Vegetable, Ornamentals AND Strawberries**

Symptoms :

- **Streaking, spotting and tissue distortion.**
- **Vectors of tomato spotted wilt virus**

THRIPS

Adult female western
flower thrips





WHITEFLIES

Trialeurodes vaporariorum



LEAFMINERS

- ❑ **Pea leafminer (*Liriomyza huidobrensis*)**
- ❑ **Garden leafminer (*Chromatomyia horticola*)**
 - **Attacks vegetables and ornamentals**

Symptoms :

- **stippling**
- **Mines**
- **Large white blotches**

LEAFMINERS



LEPIDOPTERA

- **Diamondback moth (*Plutella xylostella*)**
- **Beet armyworm (*Spodoptera exigua*)**
- **Fruit borers (*Heliothis* spp. & *Maruca testulalis*)**

Symptoms :

- **Circular holes in leaves (shot-hole appearance)**
- **leaf defoliation when high population**
- **holes in fruit**
- **internal damage of fruits**

MAJOR PEST OF STRAWBERRIES

- ◎ **FRUIT FLIES**
- ◎ **ATTACK THE FRUITS DURING RIPENING STAGE**
- ◎ **SELF LIFE OF FRUITS SHORTEN**
- ◎ **CANNOT USE PESTICIDES**
- ◎ **FRUITS CANNOT BE SOLD AT HYPER MARKETS**

LOSSES DUE TO THE DAMAGES CAUSED BY THE INVASIVE SPECIES

- ◎ RANGES FROM 30 TO 100 %
- ◎ LOSSES DEPENDS ON STAGE OF CROP WHEN INFESTED
- ◎ DEPENDS ON TIME OF YEAR (DRY OR RAINY SEASON)
- ◎ IF FRUITFLIES ATTACK STRAWBERRY FRUITS AT EARLY STAGE....LOSSES OF 100 % IS COMMON
- ◎ THRIPS THAT ATTACK THE FRUITS SUCH AS EGG-PLANT & CUCUMBER CANNOT BE SOLD IN HYPERMARKETS

LEPIDOPTERA



Beet armyworm



MARUCA TESTULALIS

LEPIDOPTERA



FRUIT FLIES



Carambola fruit fly
(Bactrocera carambolae)

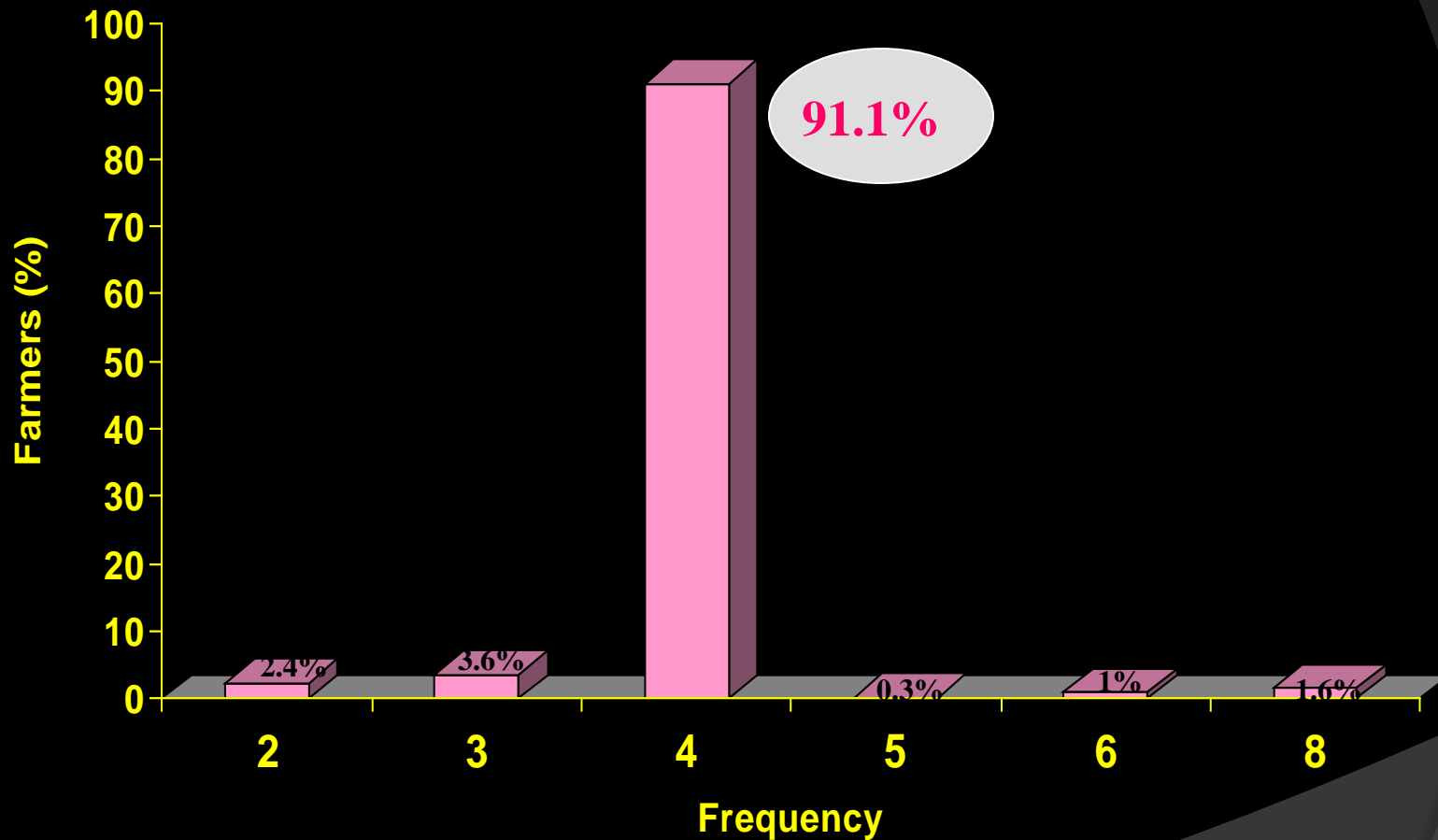
POPULAR PEST CONTROL METHOD IN C HIGHLANDS

- ◎ CHEMICAL CONTROL WITH PESTICIDES
- ◎ CALENDAR SPRAYING
- ◎ “ COCKTAIL ” PESTICIDES TANK MIX
- ◎ HIGH DOSAGES COMMON
- ◎ UNREGISTERED PESTICIDES
- ◎ LARGE % DO NOT USE PPE

WHY WE LIKE PESTICIDES

- ◎ **EASY WAY TO CONTROL**
- ◎ **QUICK RESPONSE**
- ◎ **READILY AVAILABLE**
- ◎ **READ THE LABEL, MIX AND SPRAY**

FREQUENCY OF PESTICIDE APPLICATION/ MONTH



MAJOR ISSUES RELATED TO PESTICIDES IN CH.....

- ◎ **POLLUTION OF FOOD AND THE ENVIRONMENT**
- ◎ **PEST AND DISEASE PROBLEM THE SAME FOR THE LAST 40 YEARS.....**
- ◎ **THE FARMERS ARE STILL SPRAYING LOTS OF PESTICIDES.....**
- ◎ **WHAT IS WRONG....?????**

INDISCRIMINATE USE OF PESTICIDES

- ◎ **PESTICIDE RESISTANCE**
- ◎ **PESTICIDE RESIDUES IN FOOD**
- ◎ **PESTICIDES IN WATER AND THE ENVIRONMENT**
- ◎ **USE OF UNREGISTERED PESTICIDES**
- ◎ **NON COMPLIANCE TO LABEL**
- ◎ **HAVE THEIR OWN “SECRET MIX”**

FARMERS DILEMMA

- ◎ I NEED QUALITY PRODUCE
- ◎ **THE PEST KEEP COMING**
- ◎ I HAVE TO TRY THE FASTEST WAY....PESTICIDES
- ◎ **PESTICIDES IS A PROBLEM IN THE FOOD WE EAT AND THE ENVIRONMENT**
- ◎ ALTERNATIVES LIMITED AND NO WAY OUT BUT TO BE A MYGAP FARMER

CHANGE TO BE A MYGAP FARMER

- ◎ **USE PESTICIDES ONLY WHEN NECESSARY**
- ◎ **FOLLOW THE LABEL INSTRUCTIONS**
- ◎ **USE OTHER METHODS OF PEST CONTROL...BIOLOGICAL / CULTURAL / TRAPS AND PHEROMONES (CROP ROTATION AND CROPPING CYCLE)**
- ◎ **BIOLOGICAL AND NATURAL PESTICIDES (B T, IMOs)**

MYGAP FARMER



GOOD FARMER VS IGNORANT FARMER

- ◎ **THERE ARE ABOUT 2500 FARM FAMILIES IN CH**
- ◎ **ONLY 21 MYGAP FARMERS AND 13 MYORGANIC FARMERS**





PROPER PPE AND PAT



ATTEND TRAINING BY DOA



WHAT THE AUTHORITIES HAVE DONE

- ◎ R & D INTO BIOLOGICAL CONTROL AND IPM
- ◎ INTRODUCTION OF PARASITIDS AND PREDATORS TO CONTROL SOME INVASIVE SPECIES EG DBM
- ◎ CONDUCT TRAINING PROGRAM ON BIOCONTROL GAP AND PAT

WHAT WE ARE EXPECTING FROM THE RELEVANT AGENCIES

- ◎ PEST MANAGEMENT STRAGIES WITH PROPER USE OF PESTICIDES
- ◎ MORE RESEARCH ON BIOLOGICAL CONTROL AND IPM AND NEW AREAS OF DISCIPLINE LIKE BIOTECHNOLOGY AND ECOLOGICAL ENGINEERING
- ◎ INTRODUCTION OF PARASITIODS AND PREDATORS TO MANAGE INVASIVE SPECIES (CLASSICAL BIOCONTROL)

WHAT WE ARE EXPECTING FROM THE RELEVANT AGENCIES

- ◎ TRAINING OF FARMERS IN IPM AND PAT
- ◎ EXTENSION SERVICES TO THE FARMERS (MANY FARMERS NOW GET INFORMATION FROM PESTICIDE INDUSTRY)
- ◎ PREVENTION OF INVASIVE SPECIES ENTERING THE COUNTRY (NOT GOING TO BE EASY)

Thank you..

