

Review of best practices for phytosanitary pest surveillance in Nepal

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Co-ordination among Institutions



Nepal is adopting:

- Phytosanitary measures on the basis of PRA

Until now, PRA has been done on: some crops

- Establishment of PFA: Planning for this is done since next year to export citrus to China from two districts, Syangja and Kavre Districts

- Validated Declaration for the
Absence or

Limited Distribution of quarantine pests

It has been done through quarantine check-posts and sub-check posts in the Indo-Nepal and Shino-Nepal borders (16 Quarantine offices)

Who involves in Surveillance?

- National Plant Protection Organization (NPPO) and Co-operators, Secretariats at PPD
- Directorate of Plant Protection (PPD)
- Nepal Agricultural Research Council (NARC)
- University of Agriculture and Forestry
- Himalayan College of Agricultural Science and Technology (HICAST)
- Natural History Museum
- Nepal Academy of Science and Technology
- NGOs
- Individual subject experts

Current methodology used

- Crop selection
- FAO Literatures
- Pest Status Template
- Surveillance of particular pests
 - General surveillance
 - Specific survey
- National Pest Status Record Database Version 1.0
- Crop Protection Compendium (CABI)

Nepals' Priority Commodities for Pest Data Record Preparation

- | | |
|-----------|--|
| • Lentil | • <i>Lens culinaris ssp. culinaris</i> |
| • Ginger | • <i>Zingiber officinale</i> |
| • Mustard | • <i>Brassica campestris</i> |
| • Potato | • <i>Solanum tuberosum</i> |
| • Onion | • <i>Allium cepa</i> |
| • Radish | • <i>Raphanus sativus</i> |
| • Wheat | • <i>Triticum aestivum</i> |
| • Citrus | • <i>Citrus spp.</i> |
| • Mango | • <i>Mangifera indica</i> |
| • Tea | • <i>Camellia sinensis</i> |

contd..

- Coffee
- Cardamom
- Broad Bean
- Paddy
- Maize
- Coriander
- Pea
- Tomato
- Cabbage
- Banana
- Coffea spp.
- *Amomum subulatum*
- *Vicia faba*
- *Oryza sativa*
- *Zea mays*
- *Coriandrum sativum*
- *Pisum sativum*
- *Lycopersicon esculentum*
- *Brassica oleraceae* var *capitata*
- *Musa* spp

Contd.....

- Chiraito
- Soap nut
- Jatamasi
- Pawan bark
- Chilly
- Flower bulb
- Flower bulb
- Cut flower
- Cowpea
- Garlic
- *Swertia chirata*
- *Sapindus makorosii*
- *Nardostachys flandulifera*
- -
- *Capsicum anum*
- *Gloriosa rothschildiana*
- *Heemanthus multiflorus*
- *Gladiolus* spp.; *Gerbera* spp.
- *Vigna unguiculata*
- *Allium sativum*

Crops having National Pest Data in Nepal

- BANANA
- CABBAGE
- CARDAMOM
- CITRUS
- COFFEE
- CORRIANDER
- GINGER
- LENTIL
- LINSEED
- MANGO
- MAIZE
- ONION
- PEA
- POTATO
- RADISH
- RAPE SEED
- RICE
- TEA
- TOMATO
- WHEAT

Types of Surveillance System adopted

General Surveillance

Specific Surveys

General Surveillance

Sources of Information

- NPPOs
- Other national and local Government agencies,
- Research Institutes, Universities,
- Scientific Societies,
- Producers,
- Consultants,
- Museums,
- The general public,
- Scientific and trade Journals,
- Unpublished data,
- Contemporary observations,
- FAO Regional and International Plant Protection Organizations
- CPC

The image displays several types of light traps. On the left, a diagram shows a 'Pinned Garden Cage' with a 'Light' source. In the center, a diagram of a 'Black Light' trap is shown with labels for 'White Sheet', 'Black Light (ultraviolet)', and 'Insect Collector'. On the right, another diagram shows a 'White Sheet' and 'Black Light (ultraviolet)'. Below these are three photographs: a blue light trap in a field, a white light trap in a field, and a black light trap on a stand.

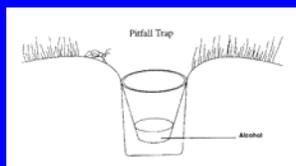
LIGHT TRAPS



INSECT SWEEPING NET IN ACTION



STICKY TRAP



Pitfall trap with steel covers and guide vane separating them. The deli cups with antifreeze/alcohol mix are submerged in the soil below the covers.

McPHAIL TRAPS



Ball trap, an improved version of the McPhail trap



CONVENTIONAL PHEROMONE TRAPS



EXAMPLE

GENERAL SURVEILLANCE OF INSECT PEST

BANANA INSECT PEST DATA SHEET

- **Scientific Name of Host:** *Musa* spp.
- **Common Name of Host:** Banana
- **Scientific Name of Pest:** *Odoiporus longicollis* (Oliver)
- **Common Name:** Pseudostem borer
- **Plant Parts Affected:** Pseudostem
- **Symptoms/Host Damage:** Riddled holes in pseudostem; rotting affected parts; root origins weakened.
- **Pest Distribution:** Widespread throughout the country
- **GENERAL SURVEILLANCE:** Research institute
- **Source Name:** Entomology Division, NARC, Khumaltar, Lalitpur, Nepal
- **Reference details:** Joshi, S.L. and D.N. Manandhar. 2001. Reference insects of Nepal. Entomology Division, Khumaltar, Lalitpur. 122 pp.
- **Name of collector:** C.E. King
- **Collector's background:** Scientist
- **Organization:** Entomology Division, Khumaltar, Lalitpur
- **Date of collection:** 14 April 1961 in Itahari, Sunsari district
- **Mode of collection:** Manually
- **Name of identifier:** Not available
- **Organization:** British Natural History Museum, London, UK
- **Date of Identification:** Not available
- **Identification Method:** Not available
- **Location where specimen collection is kept:** Entomology Division, Khumaltar, Lalitpur
- **Action taken for pest control:**
- **Economic significance of pest:** Major
- **General References:** Singh, S.S. 1966: Observations on *Odoiporus longicollis* (Coleoptera: Curculionidae) in Kathmandu valley and its suburbs. Indian J. Ent., **28**(3): 410. Neupane, F.P. 1990. Report on a consultancy service for the development of plant protection (entomological) activities at the Pakhribas Agricultural Centre, Pakhribas, Dhankuta, Nepal. 2-29 June, 1990. Tribhuvan University, Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal.

PEST DATA SHEET: SPECIFIC SURVEYS

Type of Survey:

- Detection Survey
- Delimiting Survey
- Monitoring Survey
- Other (specify)
- Not known

Organization involved:
Date survey commenced:
Date survey completed:
Date of publication (if survey details published)
Reference:
Name of collector:
Collector's background:
Organization:
Date of collection:
Mode of collection:
Name of identifier:
Identifier's background:

PEST DATA SHEET: SPECIFIC SURVEYS (CONTD.)

Organization:
Date of identification:
Identification Method:
Specimen location:
Name of verifier:
Organization:
Date of verification:
Verification Method:
Date of verification:
Verification method:

- Visual
- Grow out
- Blotter test
- Washing/extraction
- Fluorescopy
- Agar plating
- Indexing/bioassay
- Serology (e.g. ELISA)

PEST DATA SHEET: SPECIFIC SURVEYS (CONTD.)

Verification method:

- Light microscopy
- Electron microscopy

Specimen location:
Action taken for pest control:
Economic significance of pest: (major or minor pest)
 (details of known impact of pest if possible)
General References:
General Comments/Attachments

EXAMPLE

SPECIFIC SURVEY OF INSECT PEST

COFFEE INSECT PEST DATA SHEET

- **Scientific Name of Host:** *Coffea* spp.
- **Common Name of Host:** Coffee
- **Scientific Name of Pest:** *Xylotrechus smeji*
- **Common Name:** White stem borer
- **Plant Parts Affected:** Twig, trunk and roots.
- **Symptoms/Host Damage:** Tunnels with tightly packed excreta in the effected plant parts, yellowing, wilting and drying twigs.
- **Pest Distribution:** Thanapati, Thorga (Gulmi district).
- **SPECIFIC SURVEYS: Detection Survey**
- **Organization involved:** Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal
- **Date survey commenced:** 2007
- **Date survey completed:** 2006
- **Date of publication :** August 2008
- **Reference:** G. C. Y. D. and Rawat, P. (2007). Biorational approach to managing white stem borer of coffee in Gulmi district. Occasional Report. CoPP/ Helvetas, Bakhundole, Lalitpur in 61 Pp .

COFFEE INSECT PEST DATA SHEET (CONTD.)

- **Name of collector:** Y. D. G. C.
- **Collector's background:** Scientist/Academician
- **Organization:** Institute of Agriculture and Animal Science, Rampur
- **Date of collection:** October 12, 2006
- **Mode of collection:** Sticky trap
- **Name of identifier:** Not available
- **Identifier's background:** Not available
- **Specimen location:** Entomology Department, Rampur, Chitwan, Nepal
- **Action taken for pest control: Economic significance of pest:** Major
- **General References:** Joshi, S.L. and D.N. Manandhar, 2001. Reference insects of Nepal. Entomology Division, Khumaltar, Lalitpur. 122 pp.
- **General Comments / Attachments:** Also reported from India, Palpa, Arghakanchi, Syangja and other Districts

Disease scoring

Symptoms/host damage

- **Visual symptoms in the field (root, stem/ trunk, leaf, flower, fruit)**
- **Disease scoring**
- **Root /stem: (Nursery, New orchard, old orchard)**
- **0-5 Scale (1=R, 2=MR, 3=MS, 4=S, 5=HS)**
- **0= free from disease (% area infected)**
1= 1-10, 2= 11-30, 3=31-50
4=51-70, 5= >70

White grub surveillance in Nepal – A case study