Major insect-pests and diseases of major fruits available in Nepal:

Introduction:

The kingdom of Nepal is a small and totally land locked mountainous country in South Asia. It is situated between 26°22’ and 30°27’ north latitude and 80°4’ and 88°12’ east longitude. It is surrounded by India to the East, South and West and by the Tibetan region of China to the North. The shape of the country is somewhat rectangular measuring 880 km from East to West and 130 to 240 km in width. The total geographical area of the country is 147,181 square km. The total cultivable area is 3.96 million hectares of which 2.97 million ha are under cultivation. The irrigated area is only 26% of the total cultivated land; the rest depends largely on monsoon rain, 80% of which is received during June to September.

Nepal is a predominantly agricultural country. Agriculture is the lead sector for the national economy and accounts for about 36% of the GDP. About 66% of the population is engaged in agriculture. The Nepalese hill economy is characterized by typical subsistence agriculture based on cereal crops, and is practiced on terraces of often very steep slopes which are subjected to a great loss of top soil by erosion during heavy rain. Hilly soil is generally acidic and with poor nutrient content, especially nitrogen. The fruit crop cultivation is still not commercialized in the hilly region. In the Terai mainly cereal crop are cultivated and fruit crops are not generally preferred. In some terai district mango orchard has been established to make commercialized but due to different regions and problem of disease and insect pest it couldn’t well established.

Agro-ecological Classification and its Significance to Horticulture

The topography of Nepal is extremely variable ranging from 60-300 m above sea level (m a.s.l) in the southern plains to 8848 m.a.s.l. in the north, which is the highest point on earth (Mt. Everest). Big variation in altitude occurs within short distances due to which it enjoys all types of climates. Physiographically, the whole country can be divided into five zones

<table>
<thead>
<tr>
<th>Features</th>
<th>Terai</th>
<th>Siwaliks</th>
<th>Middle Mountains</th>
<th>High Mountains</th>
<th>High Himal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Area (Million ha)</td>
<td>3.1 (44%)</td>
<td>2 (12.7%)</td>
<td>4.4 (29.5%)</td>
<td>2 (19.7%)</td>
<td>2.4 (23.7%)</td>
</tr>
<tr>
<td>Geology</td>
<td>Quaternary alluvium</td>
<td>Tertiary sandstone, siltstone, shale &amp; conglomerates</td>
<td>Phyllite, quartzite limestone and islands of granites</td>
<td>Gneiss, quartzite &amp; mica shists</td>
<td>Gneiss, schist, limestone and Tethys sediments</td>
</tr>
<tr>
<td>Elevation</td>
<td>100-300 m</td>
<td>200 - 1500 m</td>
<td>800 - 2400 m. Relief 1500 m with isolated peaks to 2700 m</td>
<td>1000 - 4000 m High relief 3000 m from valley floor to ridges</td>
<td>2000 to 5000 m +</td>
</tr>
<tr>
<td>Climate</td>
<td>Tropical</td>
<td>Tropical, subtropical</td>
<td>Subtropical, warm temperate (but tropical in lower river valleys; cool temperate on high ridges)</td>
<td>Warm to cool temperate, alpine</td>
<td>Alpine to arctic (snow 6 - 12 months)</td>
</tr>
<tr>
<td>Moisture</td>
<td>Subhumid in</td>
<td>Subhumid in most</td>
<td>Humid; perhumid above</td>
<td>Subhumid to</td>
<td>Semi arid behind</td>
</tr>
</tbody>
</table>
Note:

EDR  = Eastern Development Region  
CDR  = Central Development Region  
WDR  = Western Development Region  
MWDR = Mid-Western Development Region  
FWDR = Far Western Development Region

The above table information revels that Nepal is suitable for fruit cultivation but commercialization can’t be achieved well due to the reason that there is a lots of variation of land within the certain areas and there is due to very sloppy land some area couldn’t be used for cultivation. But in comparison with cereal crops we can cultivate the fruit crops in such land more successfully. So, in case of Nepal to utilize the land maximum we have to commercialize fruit cultivation to get more benefit from per unit area.

For the commercialization of fruit cultivation we can’t remake the natural physiographic formation but we can minimize the other main problem which is the major reason for reducing the product of fruit cultivation that is the disease and insect-pests. In Nepal many losses have been occurred due to this cause. If we could minimize this problem we could maximize the product indirectly.

**Major insect-pest of fruits of Nepal:**

<table>
<thead>
<tr>
<th>SN</th>
<th>INSECT’S NAME</th>
<th>MAJOR SYMPTOMS</th>
<th>MANAGEMENT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>APPLE/PEACH/ PEAR:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1  | Wolly aphid, *Eriosoma lanigerum* | They are fruit sucker. Produce honey dew like substances where sooty mold develops. In severe infestation, the affected branches show | **Chemical method**: Agroservo oil can be used @ 5ml/lit of water.  
**Biological method**: *Aphillus mali* - a hymenopteron parasite also can be used to control.  
**Physical method**: Banding with the help of | |
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **2** | **San jose scale**  
*Quadraspoditus perniciosus* | Knots like structure. Greasy substance above 50 cm from the ground level restrict the nymph to climb the tree. **Cultural method:** Use healthy saplings. Cutting the affected branches. **Chemical method:** Use of Agro-servo oil @ 5 ml/lit. **Biological method:** Scales are often controlled by small parasitic wasps and predators including beetles, bugs, lacewings, and mites |
| **3** | **Apple stem borer**  
*Zeuzera spp* | Bore the stem of apple by larva. Release of saw dust where it has affected. **Chemical method:** Use of 1-2 drops of the kerosene oil in each hole. **Cultural method:** Plugging the hole. Cutting the affected branches and pasting with Bordeaux mixture. |
| **4.** | **Tent caterpillar**  
*Malacoxoma indica* | Makes tent like webby structure in twig and leaves. Defoliation of leaves take place. **Chemical method:** Use neem based pesticide. Use the contact poison. **Cultural method:** Pruning and removing of small twigs that hold egg masses, before egg hatch. **Biological method:** Small beneficial wasps will parasitize the eggs, larvae, and pupae of this pest. Bacillus thuringiensis var. kurstaki (Bt) is effective in controlling early instar caterpillars. | Larva is damaging stage |
| **5.** | **Slug caterpillar**  
*Caina spp* | It eats the tender leaves voraciously and remain only the vein structure and appear like the net. **Chemical method:** Use contact poison @2 ml per lit. **Cultural method:** Collection of larva and pupa. |

**PLUM:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **1.** | **Plum aphid**  
*Brachycaudus helichrysi* | Causes severe leaf distortion on the foliage of all types of plum during April to late May. **Chemical method:** Spray with thiacloprid shortly after bud burst. Zinc sulfate (36%) can be applied in early to mid-October to control this pest. **Biological method:** Important predators include: lady beetles can be used. |
| **2.** | **Plum Fruit Moth** | Pinkish white caterpillar and excrement pellets. **Chemical method:** Use of a pheromone plum moth trap. |
| Grapholita funebrana | inside ripe fruits. | Spray with deltamethrin.  
**Biological method:** Inundative releases of the braconid wasp *Macrocentrus anciilvorus* provided an average 50% reduction in number of infested fruit. |
|---------------------|--------------------|---------------------------------------------------------------------|

3. **Plum sawfly**  
*Hoplocampa flava*  
The young maggots which develop tunnel their way into the developing fruit. The only signs at this stage are the tiny holes left by the maggots.  
**Physical method:** loosen and turn the soil around the base of the tree  
**Biological method:** Azadirachtin - A derivative of the Neem Tree, Azadirachtin is an insect growth regulator (IGR). It disrupts and speeds up the molting process of larval insects. It kills the insect when they try to molt to the next phase of life too soon.  
**Chemical method:** use of soap and pyrethrin is effective. The soap will penetrate the insect's shell and kill it by dehydration. Adding Pyrethrin creates the organic equivalent of a 1-2 knock down punch. Pyrethrin is a nerve agent that will absorb into the insect and kill by paralysis. |

**WALLNUT:**

1. **Walnut Caterpillar**  
*Datana integerrima*  
caterpillars can defoliate the trees and severely affect tree vigor, yield, and nut quality  
**Biological method:** The bacterial insecticide, *Bacillus thuringiensis*, is quite effective as a control agent.  
**Cultural method:** Remove and destroy masses of larvae when they are small. |

**SUBTROPICAL FRUITS:**  
**CITRUS:**

1. **Citrus sting bug**  
*Rhyynchocoris humeralis*  
Suck the juice from fruits so juice less fruit is observed, brown ring can be found at the site of infection  
**Cultural method:** Hanging the carrion in citrus orchard attract the citrus stink bug.  
**Biological method:** *Trissolcus priapus* - a parasitoids on citrus stink bug can be used. |

2. **Citrus scale**  
*Aonidiella aurantii*  
Suck the sap, Show die back symptoms at severity  
**Chemical method:** sulphur and lime sulphur are also used against citrus snow (white louse) scale.  
Use of Agro-servo oil @500 ml/15 plants  
**Biological method:** lady bird beetle can be used as a predators.  
**Cultural method:** Over-fertilising with nitrogen should be avoided as it is known to encourage higher levels of reproduction in some citrus scales. |

3. **Citrus aphid**  
*Troxoptera citricida*  
Feed on plant part using their sucking mouthparts.  
**Biological method:** Use of lady bird beetle as natural predators.  
**Major cause of citrus decline in**
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Pest</th>
<th>Description</th>
<th>Control Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Citrus</strong></td>
<td>4. Citrus stem borer</td>
<td>Yellowing of leaves, sooty mold develops</td>
<td>Chemical method: Use systematic type of pesticide.</td>
</tr>
<tr>
<td></td>
<td><em>Stromatium barbatum</em></td>
<td>Releasing the saw dust excreta outside the hole</td>
<td>Physical method: Plugging the hole.</td>
</tr>
<tr>
<td></td>
<td>5. Citrus mealy bug</td>
<td>Suck sap, secrete honeydew which in turn develop sooty mold</td>
<td>Biological method: Use lady bird beetle and wasp as natural predators. Chemical method: Use Agro-servo oil @ 5 ml/lit of water.</td>
</tr>
</tbody>
</table>

**BANANA:**

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Pest</th>
<th>Description</th>
<th>Control Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Banana pseudo-stem weevil <em>Odoiporus longicollis</em></td>
<td>Tunnel is seen from outside and even in small wind flow the pseudo-stem will fall</td>
<td>Cultural method: Use resistant variety: Robusta, William Hybrid. Well aeration. Chemical method: Use of aluminium phosphide @ 1 tab/stem.</td>
</tr>
<tr>
<td></td>
<td>2. Banana rhizome weevil <em>Cosmopolites sordidus</em></td>
<td>Grub makes the tunnel inside the rhizome and rhizome starts to rot</td>
<td>Cultural method: Crop rotation. Chemical method: Use Umet granules pesticide @ 1-2 per pit. Larva is the damaging stage</td>
</tr>
<tr>
<td></td>
<td>3. Leaf beetle <em>Nodostoma subcostatum</em></td>
<td>They chew the fruit and the leaves seriously from August to September</td>
<td>Cultural method: It can be controlled by clean cultivation Chemical method: spraying of BHC @ 0.1%.</td>
</tr>
</tbody>
</table>

**MANGO:**

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Pest</th>
<th>Description</th>
<th>Control Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Mango hopper</td>
<td>Suck sap and secrete honeydew and due to which sooty mold develops and in sever condition wilting of leaves takes place</td>
<td>Cultural method: Use the light trap @ 1 trap/ha. Biological method: Use the entomopathogenic fungi: <em>Metarhizium</em>. Chemical method: Use of systematic fungicide every evening time.</td>
</tr>
</tbody>
</table>
### Idioscopus niveosparsus

**2. Mango mealy bug**
*Drosicha mangifera*

- Both nymph and adult suck sap from tender parts and secrete honey dew which attracts sooty mold in infected parts.

**Cultural method:** Use a greasy band of about 10-15 cm wide in the tree trunk to prevent the migration of the female into the soil.

**Chemical method:** Use systemic type of pesticide.
- Use 250 gm per tree of methyl parathion dust.

### Mango fruit fly
*Bactrocera dorsalis*

- The maggots consume the internal tissue from where decaying takes place from which fruit drop takes place.

**Cultural method:** Complete field sanitation. Collection of the fallen fruit and destroying it.

**Chemical method:** Use of methyl-eugenol trap or cuelure trap to control the fruit fly.

### Mango stem borer
*Batocera rufomaculata*

- Saw dust is seen just at the mouth of the hole made by the borer.

**Chemical method:** Use kerosene oil in the hole.

**Cultural method:** Jerking the hole with the help of a long stem. The larva is infected by a kind of entomopathogenic fungi which is *Metarrhizium anisopliae*.

### Litchi:

1. **Litchi bug**
*Tessaratoma papillosa*

- Suck the fluid from the tender parts and in severe condition premature fruiting and fruit drop take place.

**Chemical method:** Use chloropyrivus @ 2ml/lit of water.

**Biological method:** Protection of hymenopteron parasitoids in nature because the bug is easily parasitoids by it.

*It is the major problem of pest in Nepal in litchi*

2. **Lichi leaf curl mite**

- Attack the young leaves.

**Chemical method:** Spray with sulphur or...
**Aceria litchi**
causing hairy blister like gall on the upper side of the leaves: the leaves become thickened, wrinkled and distorted
kerathane 0.12@ of 1-2 ml/lit of water.
Spray monocrotophos @ 1.25 lit/1250 liter water/ha.
**Cultural method:** practice field sanitation; collect and burn all the infected leaves and maintain optimum planting density.

**GUAVA:**

1. **Guava moth**
   *Argyresthia eugeniella*
   Females penetrate guavas and lay their eggs inside the plant. In its larval form it tunnels through the guavas, damaging them.
   Upto now no any insecticide has been recommended for control.

2. **Oriental fruit fly**
   *Dacus dorsalis*
   The maggots feed on the pulp of fruit and cause brown rotten patches thus making them unfit for sale.
   **Cultural method:** The affected part should be destroyed.
   **Chemical method:** Spray with malathion 0.1 % in combination with endrin 0.02%.

3. **Scale insects**
   *Pulvinaria psidi*
   **Chemical method:** Spraying 0.05% diazinon, parathion or malathion.

**GRAPEs:**

1. **Grape vine flea beetle**
   *Sceledonta strigicollis*
   The adult consumes the fresh leaves after pruning.
   **Chemical method:** Spray with parathion 0.025 %
   Grub are not so serious for damaging

2. **Ground beetle**
   *Gonocephalum depressum*
   They suck the fruit juice from the grape fruit
   **Chemical method:** spray with 0.25 % BHC is recommended to control the diseases

3. **Leaf roller**
   *Sylepta tunalis*
   They feed on green tissue in the early stage and eat up a large portion of leaf as they grow
   **Chemical method:** Spray of endrin 0.02%/parathion 0.025%/ monocrotophos 0.04%.

**Major diseases of fruits of Nepal:**

<table>
<thead>
<tr>
<th>SN</th>
<th>NAME OF DISEASE</th>
<th>SYMPTOMS</th>
<th>MANAGEMENT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEMPERATE FRUIT'S DISEASES:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>APPLE/PEACH/PEAR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Scab</td>
<td>Olive green irregular spots are seen underside of the leaves. Later these spots become metallic black in color and appear on both side of the leaf surface giving rise to “sheet scab”. These symptoms appear in both foliage and leaf and rarely in twigs.</td>
<td><strong>Chemical method:</strong> Spray the mancozeb or captan @300 gm/100 lit of water. <strong>Cultural method:</strong> Physical removal and burning of infected leaves also can be done in small garden.</td>
<td>It is the serious disease both in</td>
</tr>
<tr>
<td>2.</td>
<td>Powdery mildew</td>
<td>Powdery growth of fungus appears on young leaves, shoots, bloom and fruits</td>
<td><strong>Chemical method:</strong> Powdery mildews are best controlled</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(fungal disease)</td>
<td>of the commercial cultivars. Greyish or white patches of mycelium develop on the under surface of the affected leaves then after leaves become crinkled, curled, hard and brittle and soon dry up.</td>
<td>with the application of sulphur fungicide. Spray carbendazim (0.05%). <strong>Cultural method:</strong> Removal of affected twigs, branches and leaves.</td>
<td>nursery and grown up trees.</td>
</tr>
</tbody>
</table>
| 3. | Cankers  
*Corticium salmonicolor*  
(fungal disease) | Dead area in the cortex of stem or branch showing repeated callusing, leading to girdling or die-back of affected plant parts. | **Chemical method:** Periodic spray of copper oxychloride (0.3%) or lime sulphur. A combination of cowdung with soil, lanolin, linseed oil and bavistin can be used to paste the cut area to prevent the canker | About 13 different spp cause the canker in apple. It is very difficult to manage once it is affected. |
| 4. | Collar Rot/ trunk canker/ crown rot  
*Phytophthora spp.*  
(fungal disease) | The infection starts from the collar region and spreads downwards to roots. Main symptoms of the disease are development of cankers near the ground line which become soft and spongy and a moist exudate oozes out of the affected areas. Rapid extension of cankered areas both in lateral and vertical direction results in girdling of the tree. | **Chemical method:** Fungicide drenching in the soil around the affected trees or painting the wounds with its paint is effective. For this the affected portion is first scrapped and disinfected with methylated spirit or mercuric chloride (0.1%) and afterwards fungicidal paints such as Bordeaux paint is used. While seedling transplantation grafting portion should be above 30 cm above the ground. |   |
| 5. | Crown gall  
*Agrobacterium radiobacter p*v. *tumefaciens* and *A. rhizogenes*  
(bacterial disease) | Globular, elongated or irregular galls are produced at or near the graft union. First evidence of the disease is a convoluted tumour production composed of light colored frostly masses of tissues. The roots are thick which gives woody appearance, characteristics of this disease. | **Chemical method:** Entire roots system of healthy grafted plants should be dipped in 1 % copper sulphate soln. for 1.5 hrs. prior to transplanting.  
**Physical method:** Destruction of infected plant material by uprooting and burning. |

**PLUM:**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1. | Shot hole  
*Stigmina carpophila*  
(Fungal disease) | Dark brown scattered lesions appear on leaves which enlarge rapidly and involve considerable area of the leaf blade. Abscission of the diseased area results in short-hole or ragged appearance while petiole infection leads to the entire leaf. | **Chemical method:** Copper fungicide in the form of Bordeaux mixture or copper oxychloride can be used. |

---

*Prepared by: Swastika Chauhan, B.sc.Ag 3rd semester, IAAS- Lamjung Campus, Lamjung*
Twig infection results in the formation of small, purplish, raised spots, which later expand into elongated necrotic cankers.

2. **Rust**  
*Tranzschelia discolor*  
(fungal disease)  
The host epidermis gets raised. Fruit infection occurs as water-soaked dark green spots at late stage of maturity.  
**Chemical method:** Use bordeaux mixture.

### WALNUT:

1. **Anthracnose**  
*Gnomonia leptostyla*  
(fungal disease)  
On the leaflets, irregular lesions, usually less than 5mm in diameter, often surrounded by a small yellow halo, are formed.  
**Chemical method:** Application of benomyl, chlorothalonil, cupric hydroxide, dodine and maneb are reported to be effective in checking the disease.

2. **Bacterial blight**  
*Xanthomonas campestris pv. juglandis*  
(bacterial disease)  
Water soaked spots on young leaves, petioles and fruits is seen. At the completion of flowering, black dots appear on fruitlets which enlarge with the fruit development and eventually the peel turns black and the kernel developing inside shrivels, becomes slimy and black.  
**Chemical method:** Spray streptocyclin 250 ppm + 0.3 % cupperoxychloride  
**Cultural method:** Remove and destroy collateral host. Don’t follow the water from infected plant towards healthy one.

### TROPICAL FRUIT’S DISEASE: BANANA

1. **Pseudostem rot or Heart rot**  
*Fusarium*  
*Gloeosporium*  
*Botryodiplodia*  
(fungal disease)  
The inner leaves rot and die, and thus interfere with the emergence of new leaves. The rot gradually travels down towards the rhizome and prevents the emergence of inflorescence  
**Cultural method:** Sanitation, good drainage adequate spacing is recommended  
**Chemical method:** Timely spraying the plants with Bordeaux mixture is also helpful

2. **Black tip**  
*Helminthosporium torulosum*  
(fungal disease)  
Elongated spots with grey centres are produced on the leaf. The spots enlarge to form large patches, blighting portions of the leaf blade. It infects the fruit mostly at the tip, starting from the floral remnants.  
The diseased fruits in a bunch must be removed. Preventive sprays with fungicides yield good result.

3. **Anthracnose**  
*Gloeosporium musarum*  
(fungal disease)  
Dark blotchy areas appear on the skin of the ripening fruit and enlarge rapidly  
**Chemical method:** Spraying with Bordeaux mixture, Dithane Z-78 or Difolatone (0.2%) gives good control

4. **Black finger**  
*Dothiorella gregaria*  
(fungal disease)  
It is the disease of young finger. Small raised pustules on the skin is seen. One or more finger may develop a jet black decay commencing at the tip and extending back until the whole fruit is affected.  
**Chemical method:** Use the fungicide : salicylanilide
<table>
<thead>
<tr>
<th></th>
<th>Disease</th>
<th>Description</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| 5. | Moko disease  
*Pseudomonas solanacearum* (bacterial disease) | Development of the yellowish discoloration of the inner leaf lamina close to the petiole | Chemical method: Dusting the tree with sulfur can be done. A Karathane (0.05%) spray is found effective against this disease. |
| 1. | Powdery mildew of mango  
*Oidium mangiferae* (fungal disease) | The powder like substances is seen in the upper part of the leaves at the region of around mid-rib which in severe condition shows the sporangial growth in the lower portion of the leaf. Such leaves curl and are distorted. | Chemical method: Dithane M-45 can be used to control this disease. |
| 2. | Leaf blight  
*Macrophoma mangifera* | Spots gradually enlarge discoloring the surrounded tissue, which 1st become biscuit colored, then brown and dark brown with slightly raised and broad dark purplish margin. | Chemical method: Dithane M-45 can be used to control this disease. |
| 3. | Die back  
*Botryodiplodia theobromae* | It is characterized by dying back of twigs from top downwards particularly of the older trees followed by complete defoliation which gives an appearance as it has been scorched by fire. | Chemical method: This can be controlled by spraying the trees by copper oxychloride sulphate and applying the copperoxychloride paste at the cut ends. Use of Bordeaux mixture(5:5:50) is found most effective to control this disease. |
| 4. | Anthracnose of mango  
*Gloeosporium raciborskii*  
*Glomerella cingulate* | Numerous oval or irregular vinaceous brown or dark brownish spots of variable sizes roundish or angular scattered over the leaf surface are the characteristics symptoms. The spot may begin from the apex of the leaf or any other portion of leaf. | Cultural method: Diseased twigs and leaves which fall on the ground are a potential source of infection. Such diseased material should be collected and all infected twigs from the tree should be pruned away and such refuse should be brunt.  
Chemical method: Spraying of Zineb, captan and Bordeaux mixture on panicles results good control of anthracnose. |
| 5. | Pink disease  
*Pellicularia salmonicolor* | Pinkish powdery coating on twigs and branches is seen as first symptoms. Fungus invades inside tissue and girdle the stem. It infers the transfer of nutrients, so leaf becomes yellow and dry, shoot and branches of tree will wilt and ultimately dry up. | Cultural method: The disease can be controlled by cutting and burning the infected branches.  
Chemical method: Bordeaux mixture should be sprays and Bordeaux paste should be applied to cut the ends. |
| 6. | Alternaria leaf spot  
*Alternaria alternata* | Symptoms appear as small, brownish circular spots on the surface of leaves | Chemical method: Application of Bordeaux mixture is found to The younger leaves are found. |
and fruits and as black patches on the twigs. Initially it becomes apparent on lower surface of the leaf where it shows light brown coloration. After a few days the infection is visible on the upper surface of the leaf also.

**LITCHI’S DISEASES:**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
<th>Control Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Litchi leaf spots</td>
<td>Colletotrichum gloeosporioides (fungal disease)</td>
<td>The symptoms of the disease start from the tip of the lamina and extend towards the base. These spots are irregular in outline and are brown in color with prominent brown margin encircling them.</td>
</tr>
<tr>
<td>2. Red rust/Algal leaf spots</td>
<td>Cephaleuros virescens (algal disease)</td>
<td>The disease is characterized by red round misty spots mostly on the leaves and sometimes also on the tender stems. Orange yellow to pink velvety coating is formed on the spots which are sporangia of the alga.</td>
</tr>
<tr>
<td>3. Fruit rots</td>
<td>Aspergillus variecolor (Fungal disease)</td>
<td>Diseased portions on the fruits are somewhat in circular patches but subsequently they coalesce and become irregular. Gradually the diseased surface turns velvety and finally brownish green color.</td>
</tr>
</tbody>
</table>

**GUAVA’S DISEASES:**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
<th>Control Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wilt of guava</td>
<td>Fusarium solani (in high moisture condition) F. oxysporum (in low moisture condition)</td>
<td>Infected plant develops the chlorosis followed by wilting of entire seedling and leaf abscission.</td>
</tr>
<tr>
<td>2. Phoma rot</td>
<td>Brown colored circular spot is produced</td>
<td>Chemical method: 1000 ppm</td>
</tr>
<tr>
<td>Disease</td>
<td>Symptoms</td>
<td>Chemical method</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>1. Downy mildew of grape</td>
<td>Disease appears on any succulent parts of the vines on leaves; small-greenish yellow spots develop on the upper surface and downy growth consisting of conidia and conidiophore appear on lower leaf surface.</td>
<td>Use Bordeaux mixture.</td>
</tr>
<tr>
<td>Plasmopara viticola</td>
<td></td>
<td>Spray blitox-50 (0.3%), zineb, maneb, mancozeb (0.2%), captan (0.2-0.5%)</td>
</tr>
<tr>
<td>2. Powdery mildew of grape-vine</td>
<td>It infects the plants at any stage of the growth, attacking all the aerial parts, especially the young leaves and fruits. Leaves show white patches on both the surfaces. Diseased vines give a sickly look and show restricted growth.</td>
<td>spraying vine with sulfex (0.2%) or bavistin (0.1%) gives effective control.</td>
</tr>
<tr>
<td>Uncinula necator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Anthracnose</td>
<td>Leaves produce dark brown spots during July-August and November-December. Depressed canker are produced at the stem and twigs. On the berries, circular brown sunken spots with dark-brown margins develop leading to their shriveling and drying.</td>
<td>Removal of diseased twigs.</td>
</tr>
<tr>
<td>Gloeosporium ampelophagum</td>
<td></td>
<td>Destruction of pruned materials.</td>
</tr>
<tr>
<td>4. Rust of grapes</td>
<td>The symptoms are numerous orange colored sori mostly on the lower surface of the leaves. Severely infected older leaves show upward curling, distortion and drying up.</td>
<td>Spraying with Bordeaux mixture (5:5:50)</td>
</tr>
<tr>
<td>Phakospora ampelophagum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Black rot</td>
<td>On leaves, red-brown irregularly shaped spots develop in which black fruiting structures of the fungus are produced in concentric rings. Small dark elliptical cankers are produced on shoots, tendrils, cluster stems and petioles. First symptoms on berries are light brown soft circular spots, as these enlarge the entire</td>
<td>Destruction of the infected vine material by burning or by deep burial helps to reduce inoculum levels.</td>
</tr>
<tr>
<td>Phyllosticta ampelicida</td>
<td></td>
<td>Pre-bloom and post-bloom treatments are done with fungicides like Bordeaux mixture.</td>
</tr>
<tr>
<td>3. Phytophthora rot</td>
<td>The organisms attack the green fruit and produces circular brownish spots at their blossom ends.</td>
<td>Monthly sprays of Dithane Z-78 (0.2%) during the months of June to November, gives effective control of disease</td>
</tr>
<tr>
<td>Phytophthora parasitica</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GRAPES’S DISEASE:**

- **Phoma psidii** over the surface of the fruit. The center gradually gets depressed and the water soaked peripheral margin remains slightly elevated with sparse fungal growth. Minute dot like pycnidia appear and they ooze out cream colored pycnidiohores.

- **Chemical method:** Use Bordeaux mixture.}

---

**Prepared by:** Swastika Chauhan, B.sc.Ag 3rd semester, IAAS- Lamjung Campus, Lamjung

---
Summary and conclusion:

The major diseases and pests of fruits available in Nepal have been described above. These are the main problems of fruit production in Nepal in terms of quality and quantity. If we could control these diseases and pests practically as mentioned above then the production rate will be easily increases as per unit of land. In the past to increase the production of agricultural commodity, cultivated land used to be increased but in the present context it is impossible. So today’s agriculturist are oriented towards the high production within the land. For this one of the most limiting factor that stands in front is that problem of insect and pest in the crops. To mitigate this problem, in Nepal, there are many problems. The main is that Nepal do not have its own surplus pesticide industry and it relay upon the abroad, secondly is that there are still lack of technical manpower that demand by the farmers. There are no abundant training programs for the farmers about the chemical, biological and cultural controls methods too. That’s why farmer apply pesticide haphazardly in their own interest which may lead more problem than as original. Many INGOs, NGOs and GOs have done many works upon it, but they made farmer not active but passive. They made farmer relay on such project only. They do not disseminate the knowledge but they made farmer habitual to relay on such program. Due to which until the project runs—the situation is under control. As the project ends the situation renew as same.

Today world don’t believe in single practice of controlling the pest and diseases. Today the term IPM has been developed as the most accepted practice to control the crop problems. In Nepal it has good scope. So, I like to say that we can adopt the IPM more effectively and more economically.
References:

- Thind, T.S. 2001. Diseases of fruits and vegetables and their management
- [DOC]

Nepal Agricultural Research Council
narc.gov.np/course/pdf/s3/horticulture_s3.doc