

## SOME RUBBER DISEASES AT RAOZAN RUBBER ESTATE OF CHITTAGONG

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Rubber tree (*Hevea brasiliensis* Muel. Arg.) is being raised commercially by the BFIDC to attain self-sufficiency in natural rubber in Bangladesh. Symptoms of panel-burrs and nodules, cankers, galls, secondary die-back and patch canker have been described. A brief review of their causes has been made. Preventive and/or control measures have been suggested for each of the diseases.

### INTRODUCTION

Rubber tree, *Hevea brasiliensis* Muel. Arg. is indigenous to Brazil. It yields latex which is commercially the most important source of natural rubber (NR). It was first introduced in Bangladesh in the year 1970 in tea gardens. The commercial introduction of this species was done by Bangladesh Forest Industries Development Corporation (BFIDC) in 1962. Since then an area of 5512 ha in eight different estates of Chittagong and Sylhet has been covered with rubber plantation, mostly on unproductive waste land and scrub forest land. It has been decided to raise 24280 ha of plantation to achieve self-sufficiency in rubber in the country. Of this 19187 ha would be raised in the public sector and the rest through private participation (Amin 1977, Hussein 1982).

Plantation forestry particularly with exotic species usually suffers from the attacks of pest and diseases (Boyce 1963), even though a few species acclimatize with the natural condition of the country. As an exotic species, rubber is no exception. Raozan Rubber Estate, the oldest in the country, comprising of about 486 ha, suffered many setbacks from the silvicultural point of view during the establishment of the plantation. It has been experiencing many disorders and diseases in the tapping stage.

In November, 1980 the authors visited Raozan Rubber Estate and closely examined some of the existing diseases. From those observations, the present note has been prepared for those involved directly in rubber cultivation.

## MATERIALS AND METHODS

Close and thorough observations of the affected trees were carried out at different sites of Raozan Rubber Estate. Diseased samples and some fruit bodies of wood rotting fungi occurring on the dying branches were collected. Isolation of fungi was done from the diseased samples. Small pieces (1 mm) from the inner core of tissue were directly transferred aseptically on Bean Meal Agar, Corn Meal Agar and Malt Agar. The wood rotting basidiomycetous fungi were recognized from the appearance of their fruit bodies. Mainly from these observations, symptoms of a number of diseases and disorders have been described. From the available literature, known preventive and/or control measures have been noted under each of the diseases for convenience of the users.

## OBSERVATIONS

The following disorders and diseases of rubber trees were observed and control measures suggested.

**A. Panel-burrs and nodules :** Varying sizes of pronounced burrs and protuberances were observed in the tapping regions of the trunk, rendering retapping of the renewed bark difficult. Nodules (hard, more or less spherical balls of wood, about the size of a pea, buried in the cortex with one or more pointed ends) were also observed.

**Cause :** Burrs are formed from increased meristematic activity which produces an excessive amount of wood if normal healing process of panel wounds, caused by careless tapping, is delayed due to some

panel disease. During normal healing of wounds nodules and some thickenings of callus edges are formed. Large burrs are usually formed due to injuries in the region of dormant buds in the stem (Rao 1975).

**Preventive and control measures :** Injury to cambium layer should be avoided by careful tapping. Prompt control of panel diseases is also necessary to prevent the formation of burrs and nodules. Panel diseases can effectively be controlled by 2 to 4 weekly sprays or brushings with 0.5% Benlate, 2% Difolatan, 0.5% Antimuein WBR or any other modern fungicide (Khan 1980, Rao 1975). Larger burrs, when formed, should be removed neatly and the resultant wound should be treated with Petrolatum (Khan 1980) or Cerano (containing 8 parts Glycerol, 2 parts anhydrous Lanolin and 0.3% Phenyl mercuric acetate) or other suitable wound dressings (Shurtleff 1966). Nodules can be removed easily by the tip of a knife and may have a wound dressing in case of any injury (Rao 1975).

**B. Cankers and Galls :** Canker was found on the stem and branches. Necrosis of bark tissues or cambium resulted in an open wound exposing the wood. They increased in size with the growth of the tree.

Rough surfaced, hard, swollen tumours or galls upto 20 cm or more in diameter were found on the trunk. Trees with galls and cankers were found to be stunted and weak.

**Cause :** Larger open wound exposing the wood may be formed due to severe injury

to cambium layer or other wound of various causes. This may also happen when normal process of healing of wounds is disturbed due to irritation by insects, mites, bacteria, fungi, viruses and nematodes (Shurtleff 1966). Galls arise from abnormal meristematic activity resulting in the formation of excessive wood tissue.

**Preventive and control measures :** Wounding of plants while transporting and transplanting should be avoided. Grafting and pruning knives should be dipped in a suitable disinfectant (70% alcohol) between cuts. Large cankers should be cut and sterilized with household disinfectant or 1 : 1000 solution of mercuric chloride in water and then painted with a tree wound dressing like petrolatum (Khan 1980) or Cerano (Shurtleff 1966). Cankered twigs and branches should be pruned and burned in dry weather.

Outer gall tissue should be excavated and chiseled off, the gall and its surrounding margins should be painted with a mixture of 1 part of Elgetol (19% sodium dinitro-o-cresol) and 4 parts of methanol (Shurtleff 1966). The damaged areas should then be painted with a tree wound dressing.

**C. Secondary die-back :** Die-back is a progressive death of shoots and branches starting at the extremities and extending downwards along the branches and main stem until the whole tree is killed (Rao 1975). Rots or progressive decays proceeding downwards through the broken ends of the branches of living trees were found causing, ultimately, the death of some branches. Three polypores with white or brown thick skin like fruit bodies were found

growing on and around the dead leafless woody twigs. They were identified as *Irpex* sp., *Poria* sp. and *Hexagonia* sp.

**Cause :** It may be caused by facultative parasites entering through damaged or weakened tissues. Tissues damaged by pruning, wind breakage, etc. offer entry to the common wound parasites—mostly the species of the fungi *Botryodiplodia*, *Collectorium*, *Phyllostictus* and *Phomopsis*. The fungi responsible are spread by wind borne spores (Rao 1975).

**Preventive and control measures :** Fungal fruit bodies and all the affected parts with a portion of the healthy tissues should be removed and burnt. The cut ends should be sterilized with a disinfectant and finally painted with Petrolatum or Cerano or other suitable tree paints. A good tree paint can be prepared by melting and stirring together 10 parts by weight of lanolin, 2 parts of rosin and 3 parts of crude gum (Shurtleff 1966).

**D. Patch-canker :** A patch-canker disease was detected appearing on the main stem above the tapping panel, but just below the forked branches. Infection was detected with the symptom of oozing out of amber coloured liquid from the diseased and swelled up areas. The bark was found to be moist rotted, and of reddish brown colour. A coagulated rubber pad with a foul smell was found under the bark where latex coagulated.

**Cause :** *Phytophthora* sp. was consistently isolated on Bean Meal Agar which probably might have caused the disease. *Phytophthora palmivora* (Butl), *P. meadii* McRae, *Pythium vexans*, de Bary (Bakshi

1976) and *Ustilina deusta* Hollm ex Fr (Rao 1975) are reported to cause the same disease.

**Preventive and control measures:** The diseased bark with a little healthy portion should be dressed with an organo-mercurial fungicide like 'Aretan' and 'Cersan' (Anon. 1975) or with other suitable fungicides like Benlate (0.5%), Antimucin WBR (0.5%) or 2% Difolatan (Khan 1980). The cut area of the bark with the surrounding portion should also be sterilized and dressed with a tree wound dressing mentioned earlier.

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