

## Diseases of Jute

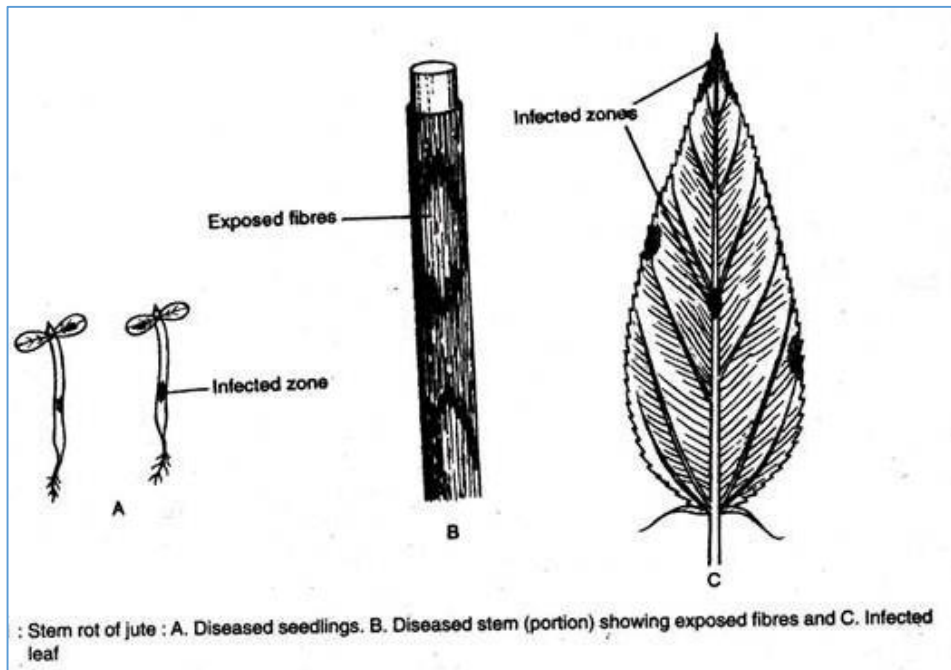
<b>Fungal diseases</b>	
Anthracnose	<i>Colletotrichum corchori</i>
Stem rot	<i>Macrophomina phaseolina</i>
Black band	<i>Botryodiplodia theobromae</i>
Leaf spot	<i>Cercospora corchori</i>
Target spot	<i>Corynespora cassiicola</i>
<b>Bacterial diseases</b>	
Bacterial leaf blight	<i>Xanthomonas campestris</i> pv. <i>capsularii</i>
<b>Nemic diseases</b>	
Root-knot	<i>Meloidogyne incognita</i>
<b>Viral diseases</b>	
Mosaic	<i>Jute mosaic virus</i>

### **Stem rot**

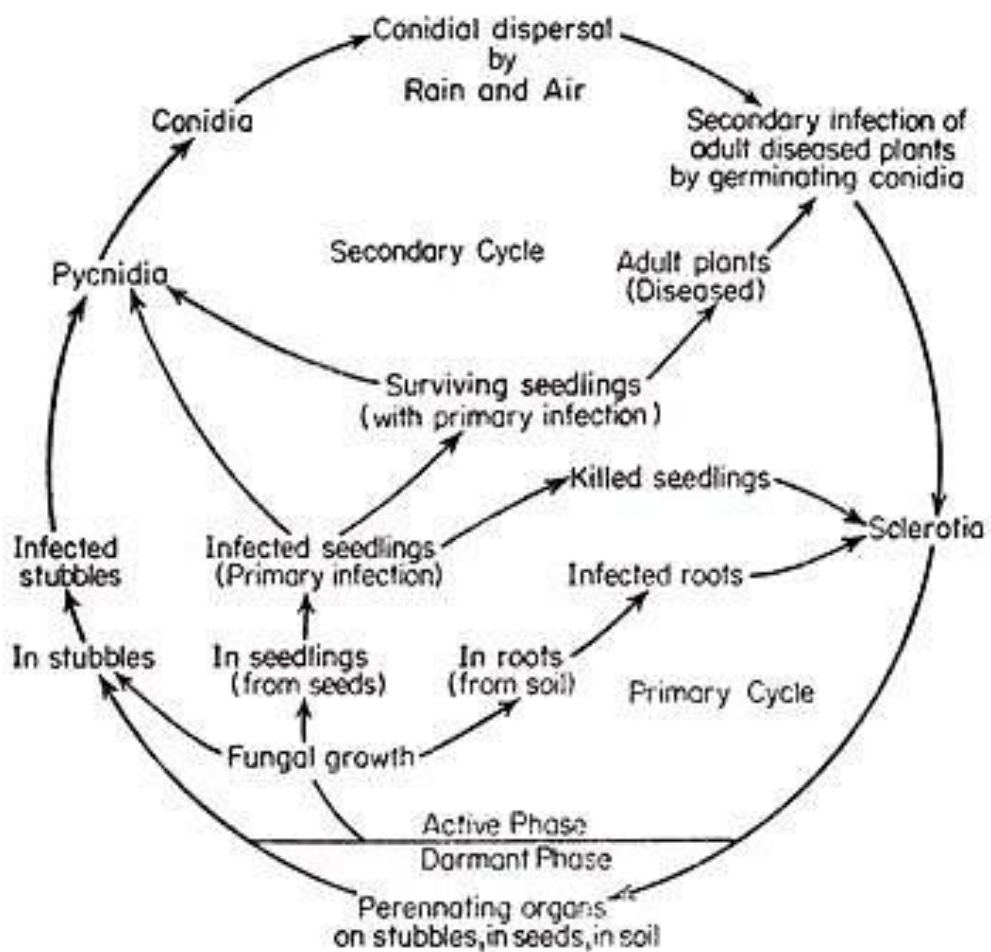
Causal Organism: *Macrophomina phaseolina*

### **Symptoms:**

This disease appear from seedling to maturity. In seedling stage blackish streak developed from the hypocotyl. In moist condition damping off occur at the seedling stage. In mature plants leaves are infected buff to black color lesions are developed at the apex, in margin, midrib and also petiole. After progress of the disease that dark brown to black lesions developed at the nodal region. This lesion spread along the stem. Cortex become shredded and exposed the fibers. The later stage of disease, the plant sheds leaves, stem rots and ultimately die. Then the capsules and seeds are also infected. Numerous black sclerotia and frequently subcarbonaceous pycnidia developed on diseased parts. Only dark black stem remains in the field.



**Disease cycle:**



### **Disease cycle of stem rot of jute**

The pathogen perpetuates on stubbles and in soil in the jute fields in its sclerotia form. It also harbours on the jute seeds under the seed coat and within the cotyledons. Where rotations are practiced, other crops like linseed, sesame or cowpea may form the collateral hosts. The pathogen has also been found to survive on a common weed *Cyperus distans*.

But primary infection is chiefly due to the seed borne inoculum than any other source. There are two phases of disease development. During the first phase the pathogen kills a large number of seedlings and young plants in the first two months. During the second phase, which starts after the plants are four to five months old, there are no deaths, but quality of the fiber is ruined owing to the formation of cankers and shredding.

Due to primary infection, symptoms appear in the seedlings on the cotyledonary leaves and the hypocotyl within a fortnight after sowing leading to the development of pycnidia. Conidia released from the pycnidia of the diseased seedlings cause secondary infection on the leaves in the vicinity of the seedlings where primary infection has been established. Both rain and air play a great role for dispersal of conidia. The conidia readily infect the leaves and the leaf infection spreads to the node through the petiole. In an infected stem, the pathogen grows in the epidermis and cortex, often invading the phloem parenchyma and the wide rays between the phloem wedges. It is also found in the central woody portion, the hyphae penetrating even the wood fibers.

Ultimately girdling of the stem occurs causing rot of the stem which leads to either shredding, canker or wilting. Usually the secondary infection is four times the primary infection. Prolonged warm and humid conditions favour disease development leading to the severe outbreak of the stem-rot. Initially abundant leaf infection is visible during and after heavy rains which gradually leads to the spread of the disease. The most critical period for the crop is first eight weeks of its growth, for it is during this period that the disease is serious.

Again if the weather during this period is comparatively dry, the incidence of the disease is less. The interval between the appearance of the stem-rot and the death of the plant ranges between one and twenty weeks. Where the top of the plant is attacked the death is quicker. Attacked plants often survive by means of callus formation. Root-rot usually occurs sporadically late in the season, but also appears early in the season when high temperature prevails.

### **Control measures**

- (i) Use clean seeds from localities where disease incidence has not been reported.
- (ii) Seeds should be thoroughly dried and before storage should be treated with Organomercuric compounds.
- (iii) Betterment of cultural practice in the following manner
  - (a) Improvement of soil pH with lime
  - (b) Application of potash between 50 to 100 Kg/ha in soil
  - (c) Good drainage and improvement of porosity (in clay soil) with organic matter
  - (d) Proper spacing 30 cm. x 7 cm., weeding, and thinning
  - (e) Crop rotation jute with paddy.
- (iv) Spraying copper oxychloride (50% Cu) at 0.75 concentration at first leaf infection produces fruitful results. Leaf infection can be reduced spraying 0.2% Lime Sulphur and Bordeaux mixture (5:5:40) under field condition.
- (v) Early harvesting reduces loss of fiber.
- (vi) Since the fungus can survive on linseed, sesame and cowpea, these plants should not be grown in jute fields.
- (vii) Jute field weed *Cyperus distans* should be eradicated to reduce the source of inoculum.
- (viii) Root-rot can be effectively controlled by the use of Brassicol

### **Black band**

Causal Organism: *Botryodiplodia theobromae*

#### **Symptoms:**

A dense black band develops around the stem of the mature plant at about 2-3 feet above the ground level. The bark of the stem in some places splits open longitudinally with exposed, brownish dry fibers at the later stages of disease development and die. Large number of minute black pycnidia is formed on the affected blackened area of the stem. On rubbing the diseased stem, fingers become black due to dark pycnidiospores.

### **Control measures**

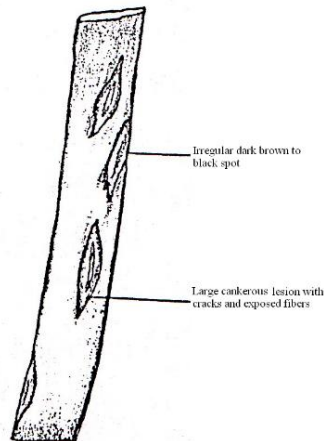
- Spraying of Dithane M-45, Manner M-45 @ 2g/L water 2-3 times.

## **Anthracnose**

Causal Organism: *Colletotrichum corchori*

### **Symptoms:**

The disease first appears as yellowish-brown, depressed water soaked spots on the stem, which soon turn into irregular lesions and may become dark brown and finally black. In most cases the lesions are elongated having tapering ends and wide at the middle giving spindle or eye shape appearance. The lesion develops cracks in the center and the fibers are exposed. Sometimes several spots may coalesce and produce large cankerous lesions and in many cases they girdle the stem. The fungus also infects the vascular bundle of the plants. The black dot like acervuli are seen on the surface of the affected area. Affected seedlings die and mature plants may wilt or survive to produce poor quality pods and seeds. The capsule and seeds are also infected.



### **Disease cycle:**

The planting materials may harbour the fungus and thus perpetuate the disease from season to season. The fungus may also persist in the soil if diseased stubble and dry leaves left in the field after harvest. The primary infection, however, appears to be mainly from infected seeds. Secondary infection takes place by the conidia produced on the affected stems. Secondary spread in the field may be through irrigation water, cultivation tools and implements and wind-borne inocula. The fungus also survives on collateral hosts *Sorghum vulgare*, *S. halepense*, and *Saccharum spontaneum*.

### **Control measures:**

- Seed treatment with Vitavax-200/ Provax-200 @ 3 g/kg seed
- Crop rotation with rice, wheat etc.

**Dieback:** Mature plants are susceptible to the dieback disease, caused by *Diplodia corchori*. The apex of the main stem or branches begins to wither and dry up progressively from tip downwards turning brown to black. Ultimately, the plant withers, leaves drop off. Lack of requisite moisture in soil and low fertility favour the disease. It is most prevalent in the red soil areas. Spraying Copper oxychloride (50 per cent Cu) and seed treatment with Carbendazim 50 WP @ 2 g/kg of seed is recommended for control.

**Soft rot:** The disease is caused by *Sclerotium rolfsii*. The fungus is soil borne. The disease initiates infection in late July onwards when the plants become older. Soft, brown, wet patches appear on the basal region of the plant above the ground level. Epidermal layer peels off exposing the fibers turning rusty brown. Eventually plant breaks off from the point of infection. Concentric ring of light and dark brown bands on the stem indicate the presence of soft rot. The fungus thrives on fallen jute leaves or plant of previous harvest. Deep ploughing and clean cultivation along with spraying Copper oxychloride (50 per cent Cu) helps to control the disease.

**Nematodes (*Meloidogyne incognita*)** – The infestation is more in sandy loam and loamy soil where repeated jute cultivation is practiced. Nematodes affected the root and as a result gall are formed. In association with soil fungi, they affect the plants. As a result leaves first get yellow and gradually the plants wither away. Heavy gall formation in early stages of growth leads to arrest of growth of the crop. During crop season the infestation starts. Applying Carbofuran 3 kg a. i./ha or Aldicarb 3kg a.i./ha may control the pest.