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# Soil Borne Diseases of Tropical Tuber Crops and Its Management

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## Abstract

Soil borne diseases are plant diseases caused by pathogens persisting within the soil matrix and hampering the growth of the plant by affecting its parts and eventually resulting in ultimate death. Soil borne pathogen groups include fungi, bacteria, viruses, and nematodes that affect belowground tissues. However, they're also responsible for causing aboveground diseases. Radical knowledge of soil-borne diseases is incredibly imperative so as to diagnose and manage the soil-borne diseases in tubers. The control of soil-borne diseases in tubers is often physical, chemical, as well as biological.

## Introduction

Tuber crops are excellent food for both developing and underdeveloped countries. On an average 45% of tuber crop production is consumed as food directly as well as by processing it in industries for the production of snacks, flour, chips and breweries. Along with human consumption it is used to feed the livestock population. It plays an important role in global food and energy security as it has quick maturity and high productivity rate (Thakur *et al.*, 2021). It acts as an important source of food for undernourished children and people of underdeveloped countries. It is also known as Climate smart crop as it is not affected by natural hazards like Storms, Cyclones *etc.* (Kloeppe *et al.*, 1999).

Here, in this article symptoms of different Tuber crops affected by various soil borne diseases have been highlighted/presented along with their management system.

## 1. Sweet Potato

**Disease:** Black rot

**Causal Organism:** *Ceratocystic fimbriae*

### Symptoms

- Dry, firm, dark coloured rot on the tuber.
- Rot continues to develop in growing tubers.
- Infected plants show stunted growth, wilting and yellowing.

### Management

- Seeds free from diseases should be selected for planting.
- Sweet potato should not be planted in sites where it has been grown during the previous 3-4 years.
- Transparent material should be collected from plants by making cut above the ground.
- Seed material should be treated with appropriate fungicides prior to planting.



Figure 1: Sweet potato black rot

## 2. Cassava

**Disease:** Cassava Tuber rot

**Causal Organism:** *Phytophthora palmivora*

### Symptoms

- The symptom starts as small water-soaked brown lesions in tuber.
- As the disease advances it cover the entire tuber.
- Finally, the tuber will get rotten and exhibit a foul smell.



Figure 2: Cassava tuber rot

### Management

- Cassava should be planted in well-drained soil.
- All crop debris should be removed by burning.
- Disease free planting material should be used.

## 3. Elephant Foot Yam

**Disease:** Collar rot

**Causal Organism:** *Sclerotium rolfsii*

### Symptoms

- Brown lesion first occurs at the collar region then it spreads to the entire pseudo stem causing yellowing of the entire plant (Sahoo et al., 2016).
- Leaves start to wilt and become chlorotic.



Figure 3: Collar rot disease in elephant foot yam

### Management

- Disease free planting material should be used.
- Proper drainage conditions should be maintained.
- Biocontrol agents should be incorporated.
- Soil should be treated with fungicides prior to plantation.

## 4. Taro

**Disease:** Pythium Rot

**Causal Organism:** *Pythium splendens*

### Symptoms

- Stunted, rolled leaves and uneven plant growth.

- White, dry, crumbling weak looking plants.
- Roots become discoloured and the cortex slough off.



Figure 4: Pythium rot in Taro tuber

#### Management

- Taro should be planted in well-drained soil.
- High quality seeds should be selected and should be treated with fungicides.

## Conclusion

Soil borne diseases can significantly reduce yields of many crops and can decimate the agricultural sector of large areas if not managed carefully. The symptoms should be diagnosed and proper integrated disease management should be employed without hampering the environment. At the same time the cost of disease management strategy should be less than the value of the crop saved for it to be economically viable.

## References

- Kloeppe, J.W., Rodriguez-Kabana, R., Zehnder, A.W., Murphy, J.F., Sikora, E., Fernandez, C., 1999. Plant root-bacterial interactions in biological control of soil borne diseases and potential extension to systemic and foliar diseases. *Australian Plant Pathology* 28(1), 21-26.
- Sahoo, B., Nedunchezhiyan, M., Acharyya, P., 2016. Incidence of collar rot in elephant foot yam as influenced by varied nutrient regimes in East and South eastern coastal plain zone of Odisha. *Journal of Crop and Weed Science Society* 12(3), 160-162.
- Thakur, D., Thakur, D., Shyam, V., 2021. A glimpse of Tuber Crop, Their Diseases and Control Mechanisms. In: *Microbial Biotechnology in Crop Protection*, Springer Nature, pp. 227-249. DOI: 10.1007/978-981-16-0049-4\_10.