

POSTHARVEST ROT IN ELEPHANT FOOT YAM

Elephant foot yam (*Amorphophallus paeoniifolius* (Dennst.) Nicolson) belonging to the Araceae family and widely cultivated for its edible tubers or corms is extensively used as a favourite vegetable by millions of people in India (Fig. 1). It is a remunerative and profitable crop and has gained much popularity due to its health benefits, high productivity, ease of cultivation, shade tolerance and steady demand. Elephant foot yam (EFY) corms on storage are prone to several postharvest diseases due to their high moisture and starch contents. Apart from damaging the corms, postharvest diseases inhibit sprouting and make the plants more prone to field diseases. Mechanical injury to the corms during harvesting and transportation makes them vulnerable to various rotting by fungi and bacteria. Preharvest infection in the field, infected soil adhering to the corms and nematode damage stimulate microbiological spoilage of the corms (Fig. 2 & 3). The incidence of postharvest losses in elephant foot yam is very high at all stages from harvesting to consumption. Postharvest rot can directly cause 25–30% crop loss and additional loss by increasing the susceptibility of the plants to pathogens in field. Considering the importance of the problem, ICAR-CTCRI conducted trials during 2019-21 and validated the results under AICRP TC project during 2021-23 in eight different states covering six agroclimatic zones of the country and the recommendations are based on these results.



Fig.1. Field view of elephant foot yam crop



Fig.2. Harvested corms in storage



Fig.3. Fungi growing from the site of injury and infestation

Symptoms

The corms affected with postharvest rot show discoloration, softening of the tissue and rotting (Fig. 4). External symptoms may or may not be there. As per our study, nine types of symptoms were observed and the symptom varies with the pathogen(s) involved with the rotting. Inner portion of the corm shows brown/black colour spots, adjoining spots coalesce and form bigger, irregular patches. In some cases, the inner portion of the corms show decaying with brown to black discoloration (Fig. 4). Brown lesions in inner portion of the corm, which turns into powdery mass of tissue in later stages was the most common symptom. In some cases, a white powdery appearance will be seen on the outer surface of the corm.



Fig.4. Elephant foot yam corms expressing different types of symptoms

Pathogen

Fourteen fungi and a bacterium, *Erwinia carotovora* cause postharvest rot in EFY. Major fungal pathogens are *Sclerotium rolfsii*, *Lasiodiplodia theobromae*, *Rhizoctonia solani*, *Colletotrichum gloeosporioides* and *Fusarium* spp.

Disease Management

Physical and cultural measures

1. Postharvest handling :- take utmost care to avoid injury to the corms. Remove adhering soil and roots. Separate damaged or corms with any sort of infection from the lot before storage.
2. Shade dry the corms :- keep the corms in open, shaded places at a temperature of $28 \pm 2^\circ\text{C}$ for a week or until the moist soil adhering to the corms drops off.
3. Store in a well-ventilated, cool and rain protected place.

Chemical measures

4. Remove the infected/damaged portions of corms and dip the corms in combination fungicide, Mancozeb 63% + Carbendazim 12% WP at the rate of 2 g/litre for 10 minutes before storing the corms (within a week after harvest).

Organic management

5. Remove the infected/damaged portions of corms and dip the corms in *Trichoderma* enriched (@ 5g/kg corm) cow dung slurry or ICAR- CTCRI developed biopesticide, *Nanma* (7 ml per litre) for 10 minutes before storing the corms (within a week after harvest).



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