



Management of Ginger Rhizome Rot or Soft Rot

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Ginger (*Zingiber officinale* Rosc.) occupy an important position among the cultivated spices in the country and is next only to black pepper and cardamom. As it is annual crop and needs very less care with high economic return, it is popular among low income group of farmers. It is popular not only for its use as spices and condiments but also for its use in perfumery and food flavouring and is credited with multifarious medicinal properties. Ginger is affected by a number of diseases. Of them, rhizome rot caused by *Pythium aphanidermatum* is the most prevalent and damaging one. Rhizome rot (also known as soft rot) is one of the most destructive diseases. The disease has been found to appear as pre-emergence or post-emergence rotting of rhizomes causing heavy losses even up to 92% in some local cultivars. It is caused by fungi (*Pythium spp.*, and *Fusarium oxysporium* f. sp. *zingiberi*) and bacteria [*Pseudomonas (Ralstonia) solaniserum*] are the major problems all over ginger growing areas of India.

Symptoms

Rhizome rot is a complex problem caused by multiple factors. The disease caused by *Pythium aphanidermatum*, *Pythium vexans* and *Pythium myriotylum* are also reported to be associated with the disease. The fungus multiplies with build up of soil moisture with the onset of southwest monsoon. Younger sprouts are the most susceptible to the pathogen. Beside pathogens, the acidic soil condition of the soil is another important factor for the disease. September onwards there will be little loss since by then temperature goes down and the rainfall is almost stopped. The pathogen of the disease is both seed and soil-borne and causes huge damage if congenial condition prevails during the growing period. The tip of the leaves turns yellow and the chlorosis proceeds downwards ultimately resulting in withering and death of the leaf. The foot of the plant and the rhizomes turn pale. Watery and soft appearance becomes evident on just above the ground level. The collar region of the affected pseudo stem becomes water soaked and the rotting spreads to the rhizome resulting in soft rot. At a later stage root infection is also noticed. The rhizomes gradually decompose turning into a decaying mass of tissues enclosed by the comparatively tough rind, which causes serious yield reduction.

Management

Efforts have been made to control this disease by several workers. It is controlled by different ways like Cultural control, Soil treatment, Seed treatment, Chemical control, Botanicals, and Nematode management. However, their negative impacts on environment and health outweigh their efficacy. Select sites having proper drainage. Select seed rhizomes from disease free areas. Treatment of seed rhizomes with mancozeb 0.3% for 30 minutes before storage and once again before planting reduces the incidence of the disease (Singh *et al.*, 2004). Cultural practices such as selection of well drained soils for planting is important for managing the disease, since stagnation of water predisposes the plant to infection. Seed rhizomes are to be selected from disease free gardens, since the disease is also seed borne. Application of *Trichoderma harzianum* along with neem cake @ 1 kg/ bed helps in preventing the disease (Khatso and Tiameraen, 2013). Once the disease is located in the field, removal of affected clumps and drenching the affected and surrounding beds with



mancozeb 0.3% or Cheshunt compound or 1.0% Bordeaux mixture checks the spread of the disease. Moreover, organic ginger cultivation is very much a feasible proposition in the state where chemical use is minimum or absolutely nil in some areas. Biological control of plant pathogens is considered safe and durable; the need to explore the potentialities of biological strategies specific to the environmental conditions.

Important Precautionary Measures for Prevention of Disease

The most important precautionary measure for prevention of disease is the use of healthy seed for planting. Secondly selection of land has to be done properly and sloppy land where water does not get stagnant must be selected. It has to be planted in raised beds with proper drainage system. Crop rotation within three to four years is a must. The plots where disease appeared before, always avoid cultivation of ginger in the same plot. The seeds sold in the market are mostly infected with the disease and such seeds must not be planted. The seeds from the infected field should never be used. It is always better to grow own seed in own land. To identify a healthy seeds one has to identify whether the seeds have healthy roots, robust, thick, well filled with good eyes, without shrinkage and spots, eyes should not be rotted and should not be watery (Srivastava, 1994). The field must be inspected regularly for the disease appearance and more often when it rains.

References:

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