

Ergot or Sugary Disease of Bajra (Pearl Millet)

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Pearl millet or Bajra (*Pennisetum glaucum*) is grown widely in Africa and India. It is one of the vital crops that feed poor people inhabiting in semi-arid and arid tropics of Asia and Africa. Pearl millet is attacked by a large number of diseases caused by fungi, bacteria, virus, nematodes and ergot disease are economically important diseases of pearl millet and cause considerable yield loss. Ergot of bajra caused by *Claviceps fusiformis* is an important and widespread disease in India. The disease causes direct grain yield loss by replacing grains with toxic alkaloid-containing sclerotia, making the produce unfit for consumption. Effective and economic control of these diseases can be achieved by growing disease resistant varieties and hybrids. Ergot of pearl millet was first reported from India and its first epiphytotic form was reported in 1956 from Satara in Maharashtra. Crop losses up to 70% have been reported due to ergot disease. Ergot infection causes loss in seed yield, seed quality, germination, and seedling emergence. Grain yield loss as high as 58- 70% has been estimated to be in hybrids. Ergot of pearl millet produces all three major groups of ergot alkaloids: Clavine alkaloids, D-lysergic acid and its derivatives and ergopeptines.

Symptoms

- The symptom of the disease is exudation of pinkish or light honey coloured small mucilaginous droplets of sticky fluid called 'honeydew' oozing out from infected spikelets.
- The droplets contain numerous asexual spores called conidia. Both macro- and micro conidia are produced in the honeydew. Attracts insects like ants and flies.
- Droplets become darker and coalesce, covering large areas of the cob. These droplets dry out within 10-15 days and are replaced by hard, dark brown to black structures with a pointed apex called 'sclerotia'.
- During harvesting and threshing the sclerotia fall to the ground and get mixed with the grain and serve as a source of primary inoculum for the next crop.

Disease Cycle

- **Primary inoculum:** Sclerotia in the soil or mixed with seed.
- **Spread:** By rain splash, insects and wind.
- **Favored by:** Cool, humid, and wet conditions during flowering.
- Ascospores infect bajra flowers during the flowering stage (especially open florets).
- Infected florets exude a sweet, sticky fluid known as honeydew, which contains numerous asexual spores (conidia).



- Rapid spread of the disease under favorable conditions (humidity > 80%, temperatures 20–30°C).

Etiology

The systemic position of the genus *Claviceps* is given below;

- Kingdom : Fungi
- Division : Ascomycota
- Class : Sordariomycetes
- Order : Hypocreales
- Family : Clavicipitaceae

Epidemiology

Ergot disease is influenced by several climatic factors like:- High relative humidity (>80%), moderate temperatures (20-30°C) with cool nights (15-20°C), cloudy weather, low sunshine and light showers favour the development and spread of ergot disease. The minimum temperature is more critical for ergot infection than the maximum temperature as higher temperature results in lesser disease.

Management

- Avoid continuous bajra cropping, rotate with non-host crops like legumes or pulses.
- The sclerotia mixed in the seeds can be separated mechanically, either by winnowing or sieving out the sclerotia from the brine solution (10% NaCl) or by using the gravity separator.
- Use of sclerotia free seeds, diseases resistance pearl millet varieties (open pollination).
- Early sowing and the judicious use of fertilizer (NPK) can help to reduce the incidence of ergot disease.
- Seed treatment with carbendazim or captan @ 2g/kg of seed reduce the seed-borne inoculum.
- The biological control Antagonistic fungi like:- *Trichoderma harzianum* may help reduce sclerotia viability.